

How to Overhaul a Hub Gear.



# Motor Cycling

No. 413.

VOL. XVI.

TUESDAY, 9TH OCT., 1917.

Registered at the G.P.O. as a Newspaper.

**T**HERE is plenty of danger in flying, but there is infinitely more pleasure and enjoyment from the handy little "Douglas." Flying becomes monotonous by comparison, and for real exhilaration there is nothing to approach the "Douglas." Your friend in the Flying Corps will tell you so.

DOUGLAS BROS., Kingswood, Bristol.  
39, Newman Street, LONDON, W.



## Douglas

Best Deliveries of **COLMORE DEPOT**  
**DOUGLAS** -Birmingham-Manchester-Liverpool-Leicester-



# THE CLYNO COMMENTATOR

A Magazine of to-morrow foreshadowed to day in a series of press announcements of which this is one

Motor Cycling.

No. 4.

Oct. 9th.

## MERIT.

*"Envy will merit as its shade pursue  
But, as the shadow, prove the substance true."*

—Pope.

We believe the merit of our productions has played no insignificant part in the creation of a much improved efficiency in the Sidecar Motorcycle.

We believe our success has been many times regarded with envious eyes, but, as Pope has it, that is only stronger evidence of the merit of which the Clyno Motorcycle is possessed.

War and its necessities have made that merit greater, therefore, in the halcyon days of peace which lie ahead, the CLYNO will be a better, swifter and more efficient mount than ever, and—

That is saying much in view of its wonderful reputation in the peace days of the past.

Next Month—"ADVERTISING."



The Clyno Engineering Co.,  
Wolverhampton.



# CHATER LEA

## THE FAMOUS No. 7 AND SIDE CAR

The Outfit that set the pace  
in pre-war days—Winner of  
the Silver Cup in the last  
A.C.U. Six Days' Trial.  
*A History-making Performance.*



NOW  
ON  
WAR  
SERVICE.

—  
PUT  
YOUR  
ORDER  
ON THE  
WAITING  
LIST.

CHATER LEA, LIMITED  
Banner St., London, E.C.1.

Established  
1891.

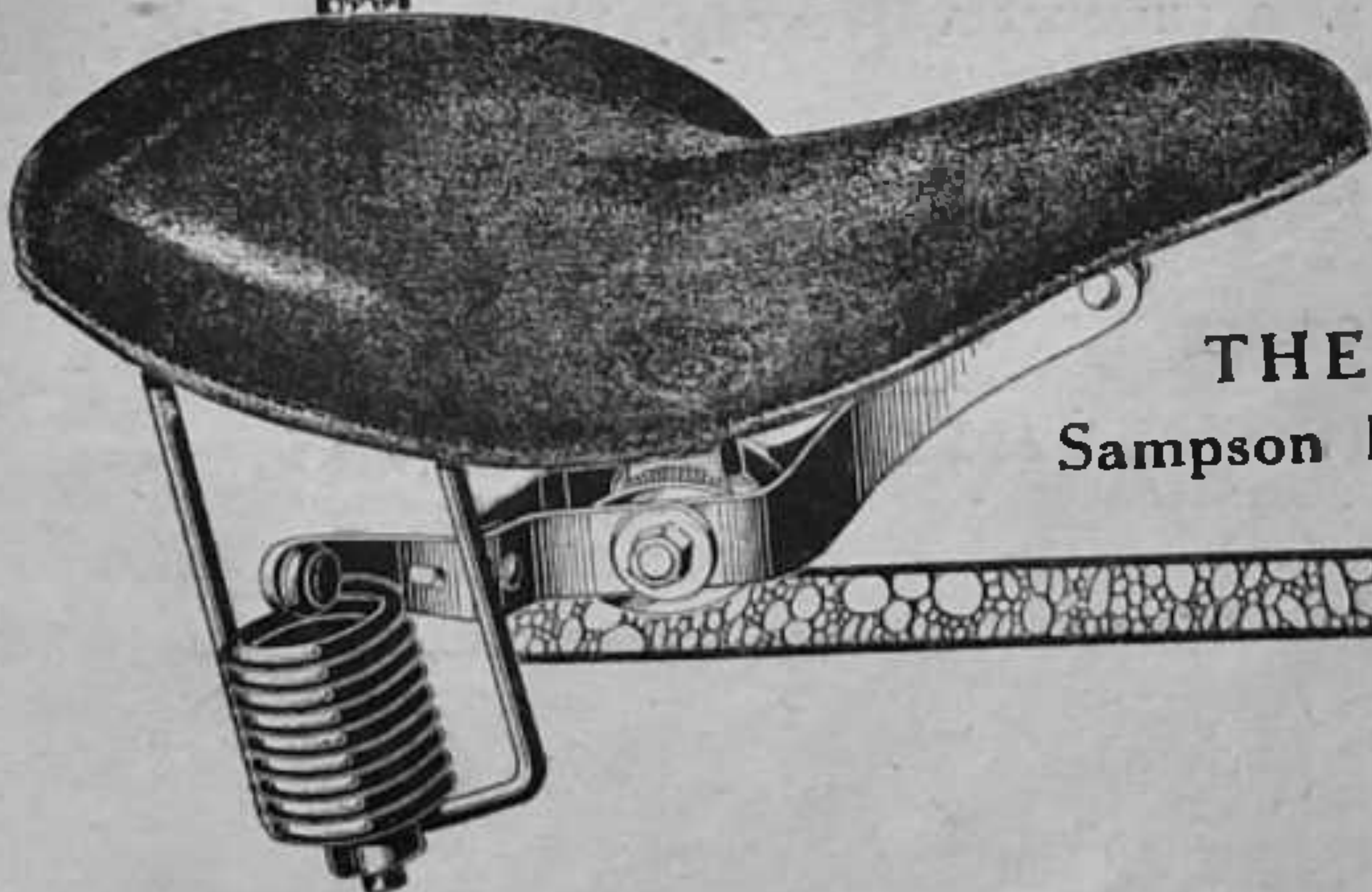
# Empire-de-Luxe

## —the Saddles of HIGHEST GRADE

The "EMPIRE-DE-LUXE" Saddle is a perfect example of British manufacturing excellence—it is designed and built solely on quality lines and in material and workmanship is HIGHEST GRADE.

Therefore in choosing an "EMPIRE-DE-LUXE" you know that it is the best saddle obtainable—a saddle that will give the greatest comfort awheel and the best possible service. Ask for Catalogue.

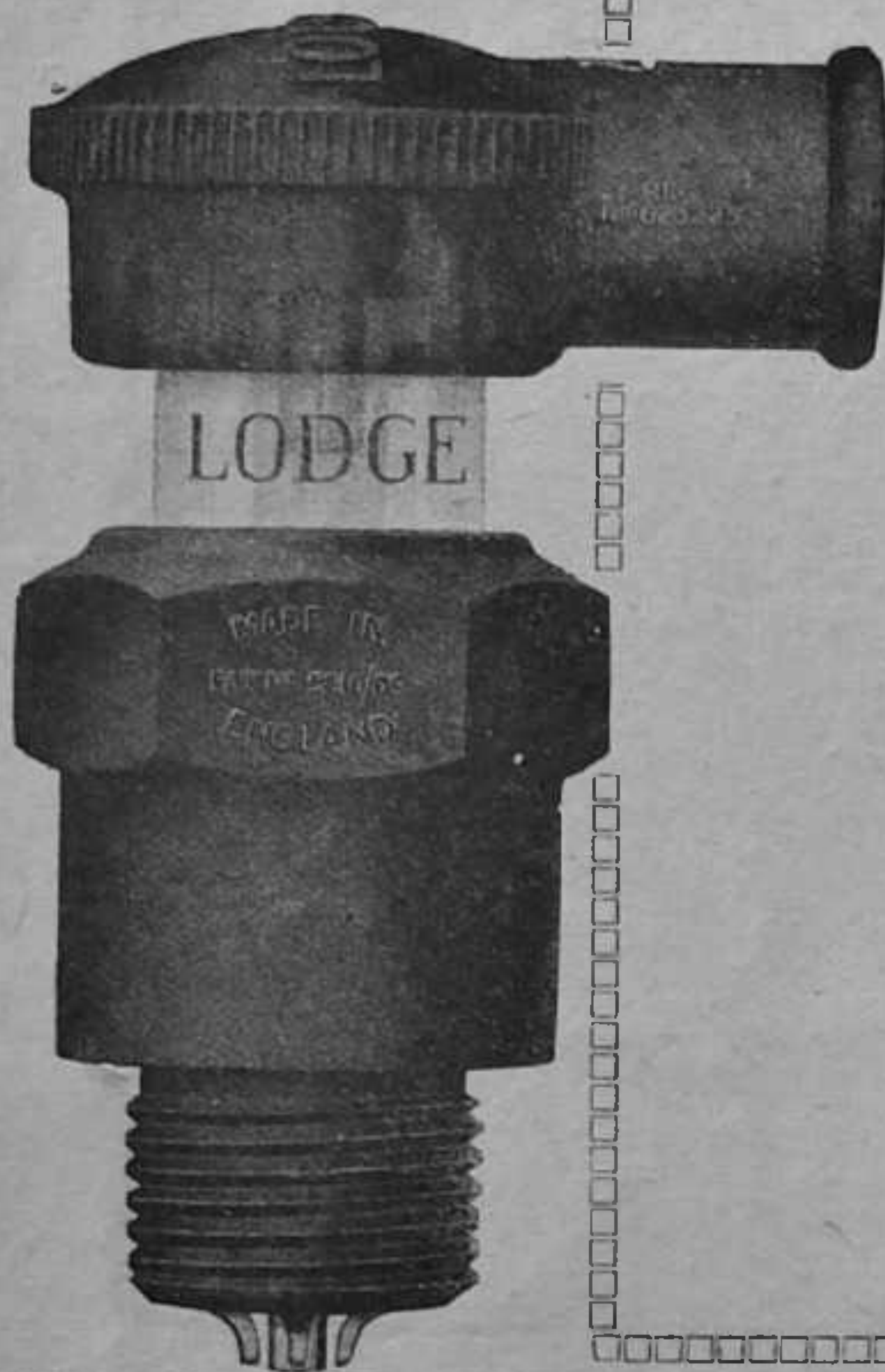
THE LEATHERIES, LTD.  
Sampson Road North, Birmingham.



HIGHEST  
GRADE

PLEASE REFER TO "MOTOR CYCLING" WHEN CORRESPONDING WITH ADVERTISERS.





The Plug that has been adopted for use by the B.E.F. on all despatch riders' machines.

If there is one type of sparking plug that more than any other is designed for use on motorcycles, it is the

**LODGE**

**WEATHERPROOF  
PLUG**

here illustrated.

This plug is unique and constitutes the ideal for motorcycle work. Note the complete enclosure of all live metal parts; and the quick pull-off and push-on of the terminal is an attractive feature. No fiddling with terminal screws.

PRICE **5/-** EACH.

Can only be supplied at present for work of National Importance.

THE LODGE SPARKING PLUG CO., LTD., RUGBY.

(Under Government Control.)

# Blackburne

*The Single with the Outside Flywheel.*

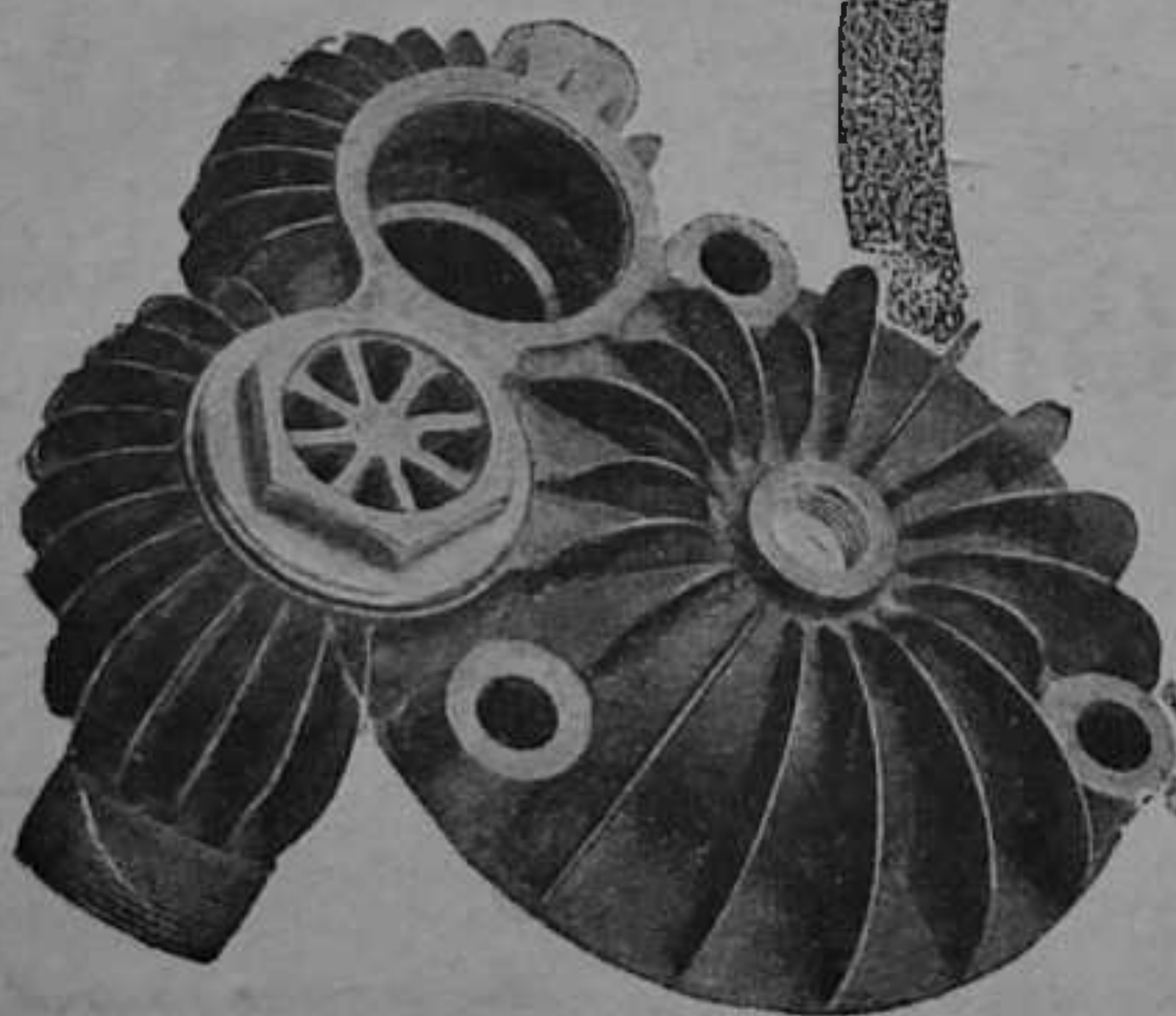


Illustration of our Detachable Cylinder Head.


Notice the deep radiating fins, the thinness and cleanness of same, also exhaust valve cap.

More points that help to place

**The Blackburne**  
on the very top for **RELIABILITY.**

**BURNEY & BLACKBURNE, Ltd.,**  
TONGHAM - - - SURREY.





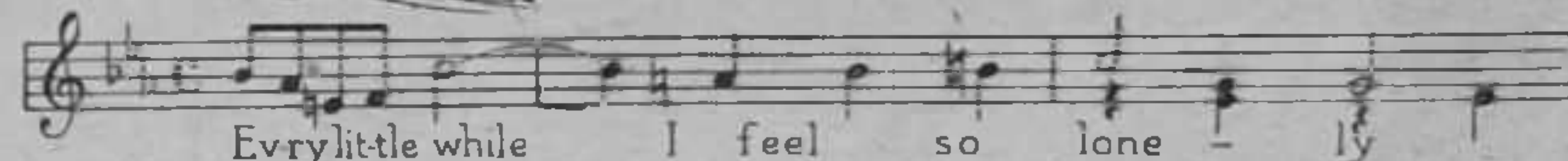
# HARLEY-DAVIDSON

## Songs of the Road.

### No 5 "Every little while"

"Every little while we used to have a breakdown—nothing very serious, perhaps—but, oh! the time and money we used to spend in wayside garages! That, however, was before we had our Harley-Davidson Combination. Now we get there and back quickly and comfortably with almost monotonous regularity, and every little while we cannot help congratulating ourselves that we decided to have the best and chose the Motorcycle Magnificent!"

**HARLEY-DAVIDSON MOTOR CO., LTD.,**  
**74, NEWMAN STREET, LONDON, W.1.**




Evry little while I feel so lone ly

**A.J.S. Prices.**

Model D, 6 h.p., Twin, 750 c.c., 3-sp.	£84 0
Coachbuilt Sidecar to suit	18 18
Model A, 4 h.p., Twin, 550 c.c., 3-sp.	£76 0
Coachbuilt Sidecar to suit	17 17

*Above prices are subject to 7½% advance.  
 Hood, Windscreen, & Spare Wheel are extras.*





# VICTORY OF SPEED

## & RELIABILITY.

# A.J.S.

The explanation of the A.J.S. success—both in the last T.T. race and in everyday service at home and abroad—is found in the valuable original design—features detailed in the remarkable specification.

Its power, comfort, accessibility and economy are appreciated no less than its wonderful speed and reliability—and the characteristics which ensure them all are common to each A.J.S. model.

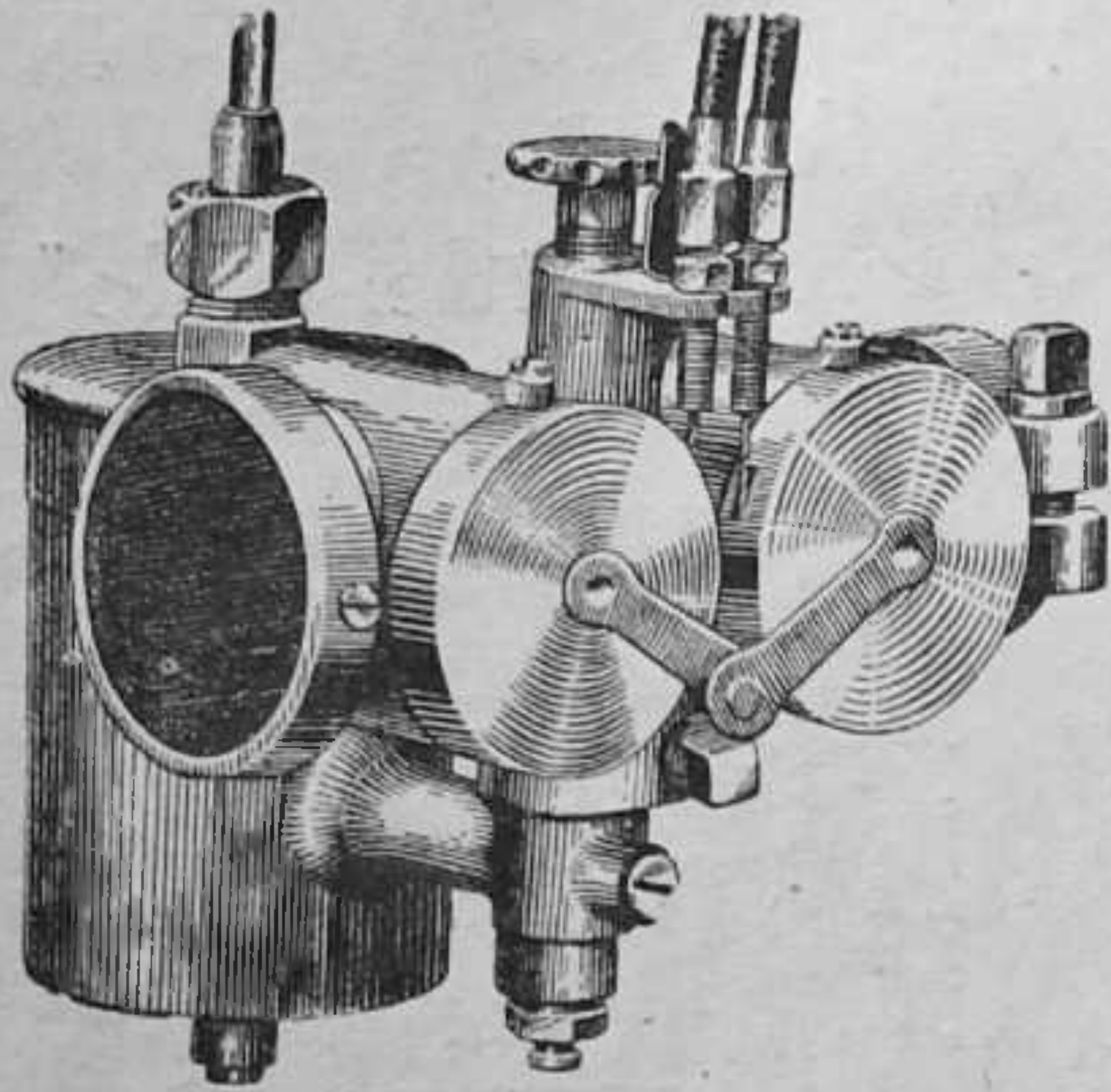
**A. J. Stevens & Co. (1914), Ltd., Wolverhampton.**  
 London Agents: H. Taylor & Co., Ltd.,  
 Store Street, Tottenham Court Road.

The original A.J.S. features include:—

Scientifically - built straight tube frame. Powerful, silent, and vibrationless A.J.S. engine. All-enclosed weatherproof chain transmission.

Kick-starter with enclosed mechanism. Special 3-speed countershaft gear. Patent gate change. Handle-bar controlled perfect multiple plate clutch. Forced lubrication direct to main bearings and big-ends. Interchangeable detachable wheels, etc.





## Some B.S.A. exclusive features.

No. 4.

B.S.A. CARBURETTER.

A POINT of special interest in the B.S.A. Variable Jet Semi-Automatic Carburetter is the ease with which it lends itself to economical motor cycling. Without dismounting, the rider can alter the jet by a slight turn of the adjusting screw, and regulate the amount of petrol vaporized to suit any condition from walking pace to full power for hill climbing. The B.S.A. Carburetter is of the well-known B.S.A. quality, material and workmanship, and the B.S.A. system of perfect interchangeability is strictly adhered to.

Write for Latest B.S.A. Catalogue.

THE BIRMINGHAM SMALL ARMS CO. LTD., 48, Small Heath, BIRMINGHAM.



*For Solo*

*& Sidecar.*



FOUNDED 1902.  
NEW SERIES BEGUN 1909.

Conducted by  
EDMUND DANGERFIELD  
Conductor of "THE MOTOR,"  
"CYCLING," etc.).

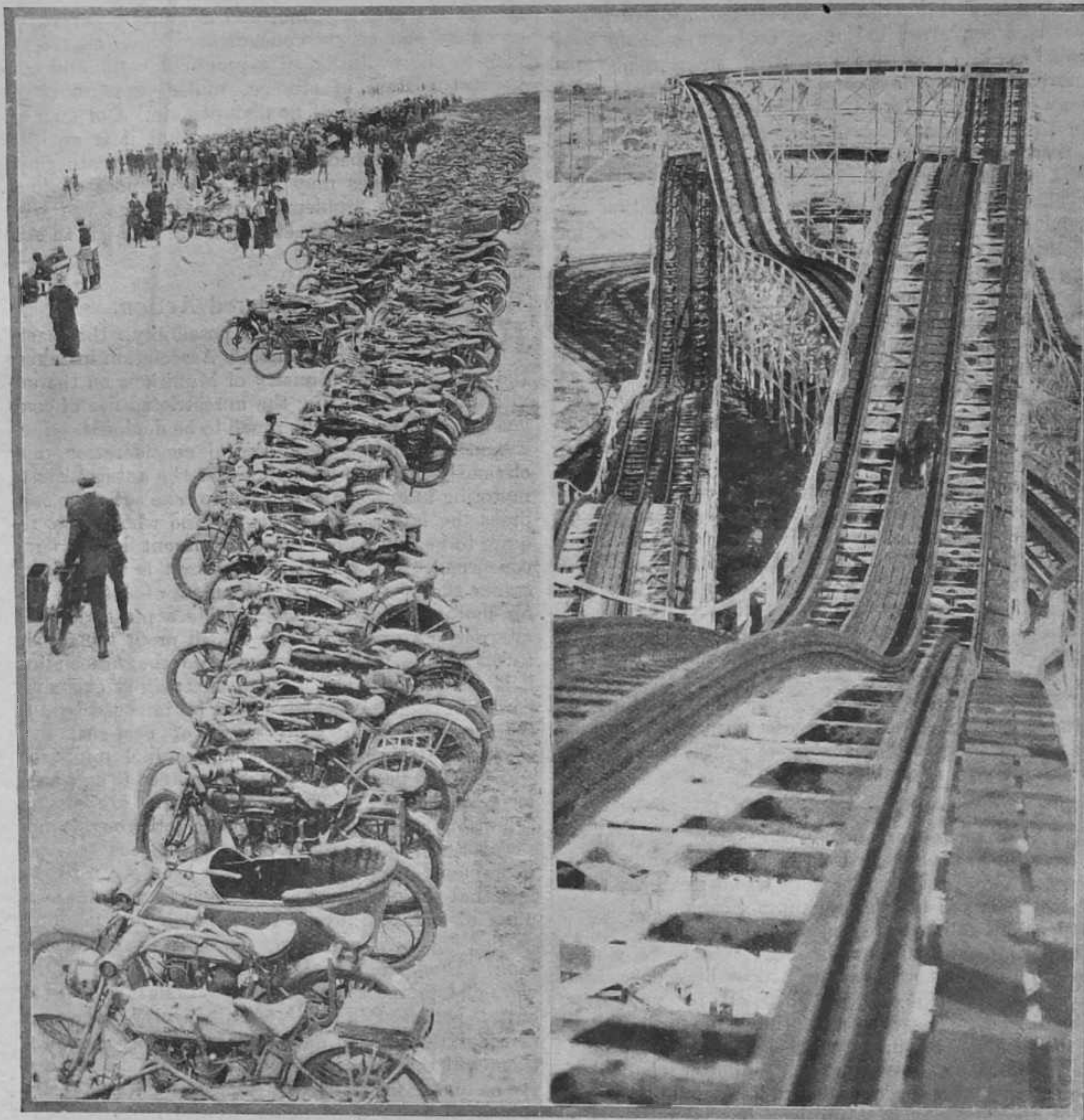
# MotorCycling

*A Newspaper for Motorcyclists only*

Edited, Written, and Illustrated  
by  
A STAFF OF  
PRACTICAL  
MOTORCYCLISTS.

Offices: 7-15, ROSEBERY  
AVENUE, LONDON, E.C.

## A "Dare-devil" Motor-cycling Feat.



A great meet of American motorcyclists took place recently at Seal Beach (reported on page 428). One of the most remarkable motor-cycling feats was performed by Blick Walters, who rode a Henderson machine on the Roller coaster. Note the four-inch sleepers that had to be crossed, riding between the rails. The rider is shown ascending the first rise. Other photographs on page 429.



## EDITORIAL

The Great Possibilities of Coal-Gas—Our Demonstration—  
Alternative Gas Fuels Considered.

## A Practical Demonstration.

**M**OTORCYCLISTS, we find, have taken a very great interest in the possibility of using coal-gas as an alternative fuel, a possibility which has now become an actual fact. There are known to be at least six motorcycles running successfully on this fuel, and every week we hear of fresh experiments. To stimulate interest in, and therefore development of, this important matter, a demonstration of petrol vehicles converted to run on coal-gas is being held this week. The demonstration takes place to-morrow (Wednesday), and will be held by the courtesy of Messrs. John I. Thornycroft and Co., Ltd., in their extensive repair depot in Pulford Street, Grosvenor Road, London, S.W. between the hours of 2.30 p.m. and 5.0 p.m. No doubt many motorcyclists will take advantage of the invitation extended to attend this demonstration, and see for themselves what are exactly the conditions for converting a machine to run on coal-gas, but it should be understood that admittance can only be obtained by card, obtainable from "The Commercial Motor" Gas Demonstration Dept., 7-15, Rosebery Avenue, London, E.C. 1. Various motorcycles, as well as other vehicles, will be shown fitted with gas containers, some being of the compressed type, and there will be persons present to explain what has to be done to enable any type of vehicle to run on coal-gas. Perhaps, when it is seen that the fitting of a gas bag is not such a difficult matter as is supposed, while the alterations to the carburetter are comparatively trifling, many others will be induced to run on coal-gas. We would hold out little hope for the immediate development of pressure systems. At present the only practicable system is to carry the gas in a container at atmospheric pressure. The bag is admittedly unsightly, and the distance that can be run is short, but it is better to do something to enable our machines to be run than that, by the restrictions imposed on the use of petrol, they should be rendered unrideable.

## Other Alternative Gas Fuels.

**M**ANY people are considering other alternative fuels, such as hydrogen, water-gas and acetylene. We would not like to go so far as to say that these fuels are hopelessly impracticable, but theoretical advantages are discounted by the practical difficulties entailed by their use. Water-gas, which is obtained by passing steam over red-hot coke, and hydrogen, which can be obtained by numerous chemical methods, have a calorific value far less than either coal-gas or petrol, while the cost of production is prohibitive. Acetylene has a better chance of being used with success, although it should be noted that the Ministry of Munitions has recently commandeered all supplies of calcium carbide, which would rule it out of present consideration. It is a fuel, however, that tempts one to experiment, for

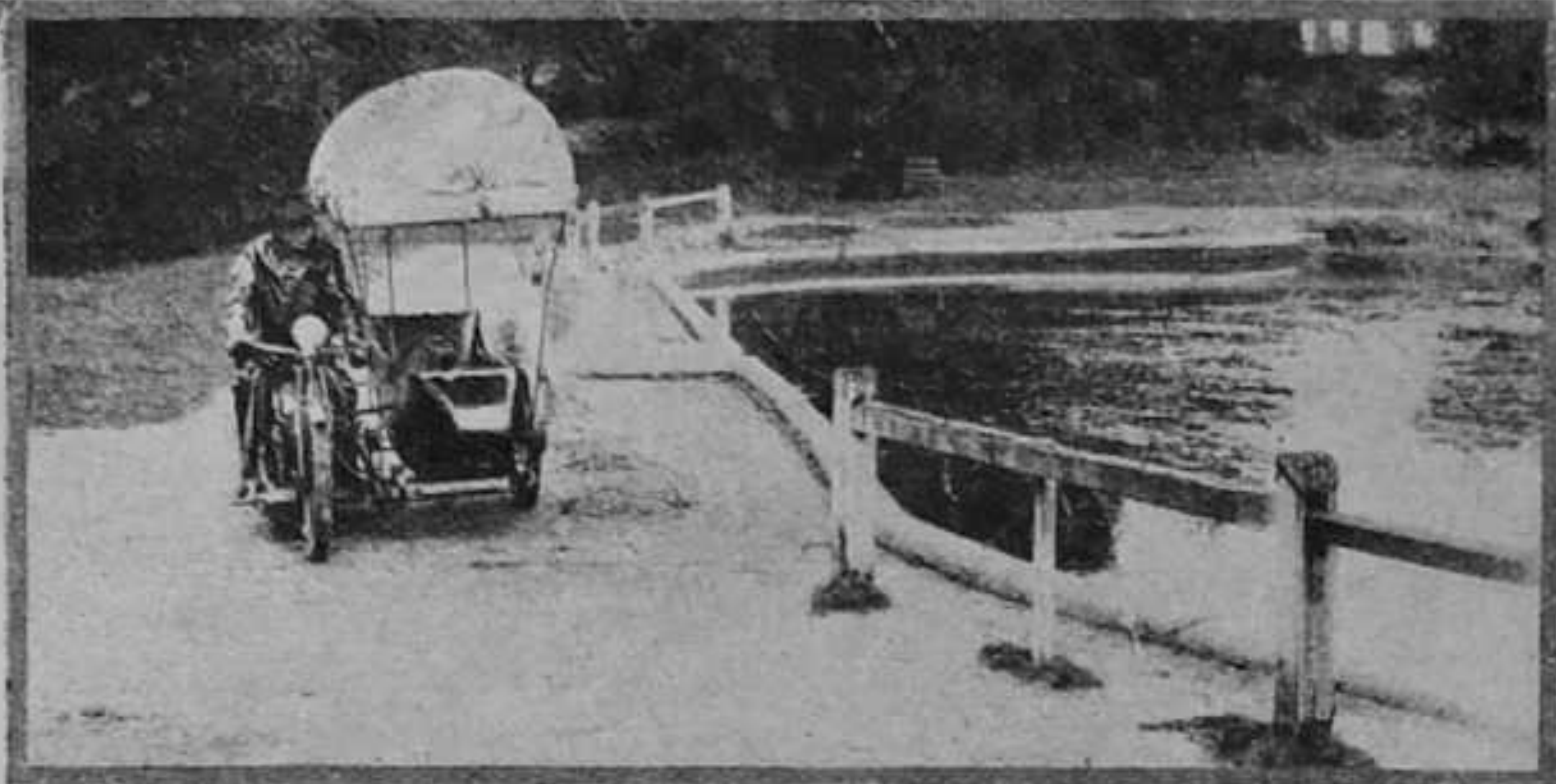
it has a far wider range than petrol, and therefore would afford greater flexibility, while its occlusion is a comparatively simple matter. Its chief disadvantage is that no engine, as at present constructed to run on petrol, would withstand the explosive mixture which it would be possible to obtain from it. From all points of view, therefore, it seems that there is no better alternative to coal-gas worthy of consideration at the present time, and it would be as well if chemists and others concentrated upon that. We look to the evolution of a practical, light and convenient system of storage, under pressure or by occlusion, or both, at no distant date. Our own experience with coal-gas suggests that it is an ideal fuel in many respects, and when colder weather sets in its advantages may become still more obvious. If the various problems surrounding its use were solved, we should expect the use of coal-gas to continue after the war.

## An Ill-considered Action.

**B**ECAUSE of its future possibility, the hasty action of the Automobile Association in taking the opinion of the Ministry of Munitions on the advisability of permitting the unrestricted use of coal-gas in motor vehicles, is much to be deplored. Such a matter requires very careful consideration, and obviously provides a loophole for the antagonists to motoring in any shape or form to take action to suppress the latest development. The whole facts require to be laid before the Government departments concerned. Not the least important is the circumstance that the present development of this new fuel for motor propulsion may provide a most valuable alternative to petrol, which it will profit the nation to encourage. In the letter from the Association it is pointed out that "Much uncertainty exists regarding conditions which might be imposed by the Government upon such users of coal-gas, and especially whether the use of the fuel might be restricted by licences, or strictly confined to cars used for special work." The reply from the Ministry of Munitions is, as might be expected, thoroughly unsatisfactory, and may have disastrous effects. Prominent attention should have been given to the fact that the greater use of coal-gas accelerates supplies of valuable by-products which are urgently needed for high explosives and for fertilizing the land. Thus, the use of coal-gas helps us to win the war, and promotes, as Professor Long has pointed out, "potential bread." Another very important consideration is that only by the absence of restrictions will this new movement develop, and we can see no reason for restricting the use of gas as is really suggested by the ill-considered letter from the A.A. and M.U. Once again, apparently, have our motoring institutions let us down, through being so hopelessly out of touch with modern facts.



# NEWS in BRIEF



## Light-up, Saturday, 13th October.

London	5.45 p.m.
Newcastle	5.45 p.m.
Birmingham	5.48 p.m.
Edinburgh	6.18 p.m.
Liverpool	5.51 p.m.
Bristol	5.53 p.m.
Dublin	6.36 p.m.

## Lighting-up Times.

Lighting-up time in Ireland and Scotland is one hour after sunset, but the Scottish lighting regulations (vehicles) come into effect half an hour after sunset.

Lighting-up time in England and Wales is half an hour after sunset.

Moon.—No moonlight this week-end.

## Pedestrians and the Roads.

IT is not often that one finds a local paper discouraging the use of the centre of the road by pedestrians, yet the "Southern Times," of Weymouth, has some very pointed remarks upon this unwise practice.

## Reckless Munitioneers.

NO fewer than eight motorcyclists, most of whom were described as munition workers, were fined at Solihull Police Court in one day recently for various technical offences, chiefly connected with driving at excessive speed. In several cases the defendants were charged merely with failing to produce driving licences when requested to do so, which looks rather like a police campaign against motorcyclists in this district.

## Enfield Finance.

THE directors of the Enfield Cycle Co., after paying a dividend at the rate of 7 per cent. per annum, less income tax, on the "A" preference shares for the half-year to 31st August, announce a dividend of 12½ per cent. per annum upon the "B" preference and ordinary shares, free of income tax, for the same period. This is identical with the distribution for the previous year, but is a reduction upon that for the first half of 1914-15, which was 20 per cent.

## Why Drag the Motor Into It?

IT seems to be the fashion nowadays to make a scapegoat of the motor upon all occasions when censure is deemed necessary, but surely it is carrying the joke a little too far when one reads such as the following in the correspondence columns of a provincial paper:—"It would be useless to protest against the quite unnecessary speed of the motor vehicles and bicycles in our streets, but church-people have a right to object when the spirit of the motor is brought into our churches, and when the prayers and lessons are indecently hurried." This amounts to a foolish insinuation that motor-ing is responsible for a fancied deterioration in ecclesiastical administration. Some people seem totally unable to leave the motor alone.

## Motorcycle-making Employees take French Leave.

AN unusual case was heard at the Leeds local munitions tribunal recently, at the instance of the Ministry of Munitions, when a number of persons, including women, employed in a controlled motorcycle-making concern, were charged with not having attended regularly at their work. It was stated that the concern was engaged upon very important work, building motorcycles for the Royal Flying Corps, and delivery had been behindhand for some time. Various excuses were proffered by the delinquents, among others that the Ministry of Munitions had promised them ten days holiday. Small fines were inflicted in each case, and the offenders were warned that a repetition of the offence would not meet with such lenient treatment.

## The Gas Demonstration.

A FULL description of the motorcycles and other interesting features exhibited at to-morrow's demonstration of vehicles converted to coal-gas will appear in our next issue.

## Alleged Thief's Jump in the Dark.

A BAGSHOT man, charged with the theft of a motor-cycle, struck the constable who was taking him handcuffed to the police-station, and jumped over the parapet of a bridge into the water twelve feet below, disappearing into the darkness. The water was about two feet in depth.

## A New Form of Compulsion.

ON the application forms for the payment of the super tax of 6d. per gallon on motor spirit licences appears a new clause which warns the applicant that in the case of national necessity the car and its driver must be held at the disposal of the military authorities. We presume that this will apply to motorcyclists as well.

## Leniency for the Army.

COMMENTING upon the wildness of Army driving, the Chairman at Sleaford Court recently remarked pathetically: "The drivers are young, and in a hurry, and youth takes liberties, and we are the sufferers. We all wish to help the authorities, but I think no more need be said." And the summons was dismissed.

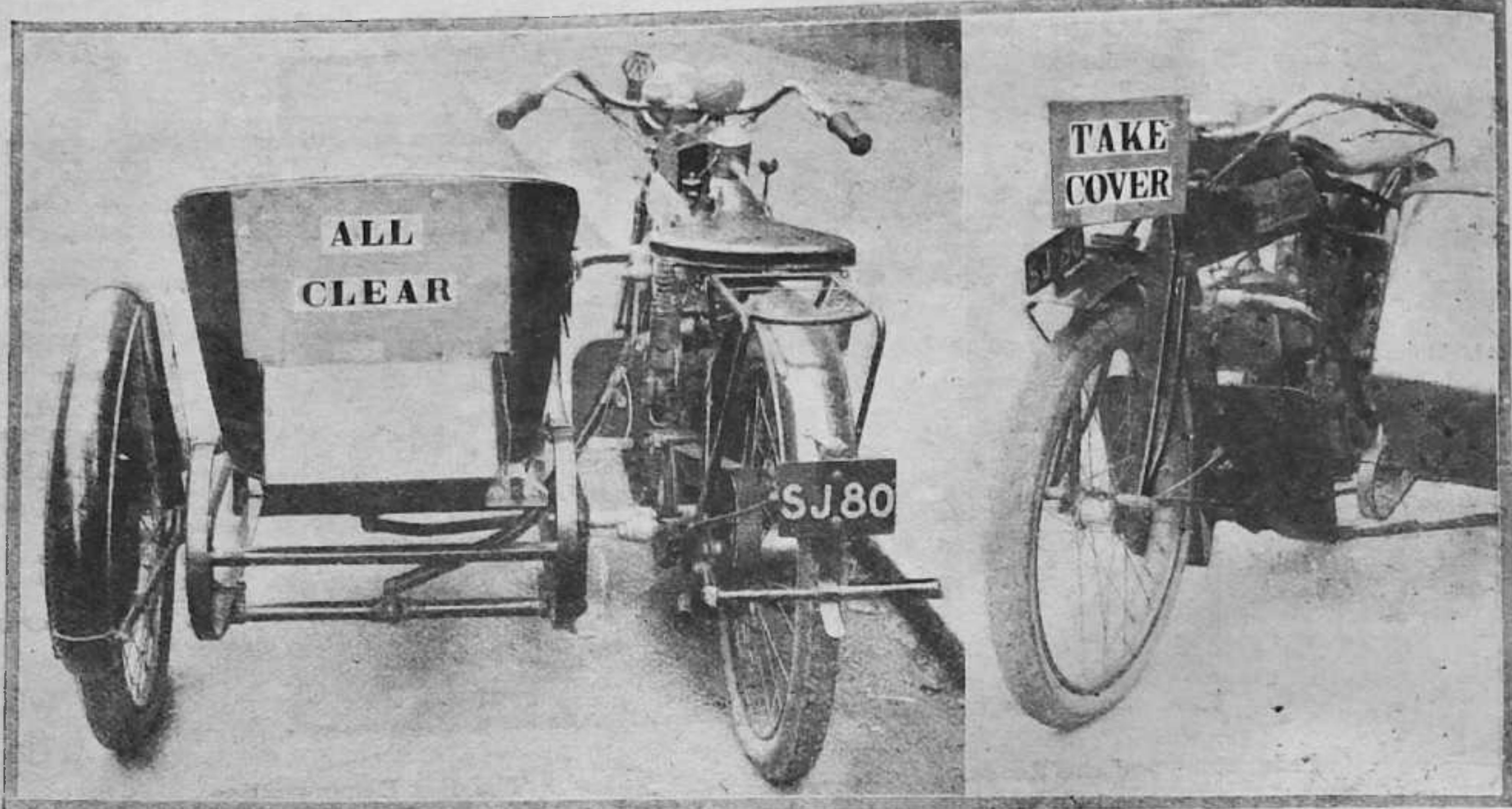
## "Wobbling" at Speed Impossible.

DEFENDING himself against a summons for dangerous driving, arising out of a collision, a motorcyclist of Fernhill Heath declared on oath that it was impossible to "wobble" on a motorcycle when riding fast, as he had been accused of doing. What about that distressing symptom known as "Brooklands Wobble," however?

## A Dinner to Capt. J. Woodehouse.

A VERY interesting dinner, having regard to the special circumstances in which it was arranged and the number of well-known motoring men present, was that given recently by members of the Sutton Coldfield Automobile Club in honour of an erstwhile member, Capt. "Jack" Woodehouse, D.S.O., M.C., R.F.C., before his return to military duty in France. A formal presentation was made to Capt. Woodehouse of a gold cigarette case and a gold matchbox, both bearing appreciative inscriptions. Tribute to the distinguished career of the guest of the evening was paid in an eloquent speech by the chairman, Mr. Alec Ross, and evoked great enthusiasm. In the course of his response Capt. Woodehouse remarked that his motor-cycling experience has been extremely useful to him as a training for work with the flying service. Other interesting speeches, interspersed with musical items, were made by well-known members of the industry, including Lieut. Perryman (Birmingham M.C.), Mr. Tom Silver, of Quadrant fame, Mr. P. E. Baker (Precision), Mr. S. A. Newman (Ivy), and Mr. E. C. Paskell (Colmore Depot).





Mr. W. H. Wells, of the Hendee Co., at the request of Sir Edward Henry, the Commissioner of Police, has improvised the illuminated warning devices shown on a Powerplus Indian for use during air raids. The "Take Cover" and "All Clear" notices are easily interchangeable.

#### Air-raid Warning by Motorcycle.

AN interesting device has been originated by Mr. W. H. Wells, of the Hendee Co., in response to a demand by Sir Edward Henry for raid-warning signals to be displayed on the machines of special constables. Mr. Wells's device, which he uses on his Indian machine, consists of a triangular cardboard cage, which slips over the headlamp, fitted with a metal ring, to keep the sign firmly in place. On two sides of the triangle are inserted strips of thin white paper, bearing in red the words "Take Cover." The light from the headlamp shines through these strips, so that the letters glow brightly in darkness. Another sign is neatly fitted into the locker at the back of the sidecar, the locker flap hanging down, and a small electric bulb is fitted inside to illuminate the sign. "All Clear" placards are substituted for the "Take Cover" warnings after the raid. The fitting of the signs takes but a few seconds, and probably a more efficient method of warning the public could not be devised.

#### Hong Kong and the Motorcycle.

MOTORCYCLES enjoy a considerable popularity in and around Hong-Kong, especially for solo work in the mountainous districts of the colony. A considerable number of sidecar outfits is also in use. They, in conjunction with cars, form the subject of an interesting report by the United States Consul-general at Hong-Kong, in which it is stated that, notwithstanding war conditions, the authorities are giving considerable attention to road improvement in the vicinity with a view to encouraging and accommodating motor traffic.

#### Watch the Road Always.

IT is a common occurrence to see motorcyclists bend down to look at their tyres or the engine while driving. The danger of this habit was brought into prominence at Banford recently, by the fate of a Sheffield engineer, who, while bending down to look at his engine in this manner, failed to notice an approaching car, with which he collided. Severe injuries were sustained by himself and his sidecar passenger.

#### Munition Workers' Motorcycles.

"THE employees at munition works are calling for a suspiciously large amount of petrol for motorcycles," stated "The Star," the other day. We hope the sleuth-hounds in Carmelite Street will not get to hear of this. On the other hand we hear of munition workers living a long distance from the factories obliged to abandon their motorcycles owing to refusals to renew motor spirit licences.

24

#### An Air-raid Exodus.

WAS it incidental to the general exodus from "air-raid districts," now in full swing, or was it merely a result of one of the last fine week-ends, that the roads into the country were so thronged with vehicular traffic last Saturday and Sunday? Cyclists, particularly, were in evidence, and some motorcyclists, most of the latter with family outfits and a good deal of luggage.

#### Air-raid Souvenirs From the Roads.

THE roads are being impeded by small boys with screw-drivers and penknives, intent upon salvaging shrapnel souvenirs of the air raids from the roads. In some places the surface was so bespattered with fragments that they could be detected from the saddle while riding over them.

#### The Motorcycle for Bill-posting.

A BILLPOSTER in the Clapham district finds an Enfield commercial combination extremely useful in his business. The posters, short step-ladder, paste, pails, brushes, etc., are all carried in the sidecar, and one man can poster a whole placarding in half the time taken by two workers on foot.

#### Five Pounds a Gallon.

STIFF fines are, apparently, the order of the day in cases of offences against the petrol regulations. Captain James Campbell Besley, lecturer and explorer, was fined £50 and costs at Leamington recently for obtaining ten gallons of motor spirit without a licence. Gas is cheaper.

#### — And Still Running!

QUITE recently we noticed a sergeant in the M.T., A.S.C., threading his way through the concentrated traffic in the City upon a very early Douglas. In spite of the lack of speed gears and clutch he never seemed to be held up in any way.

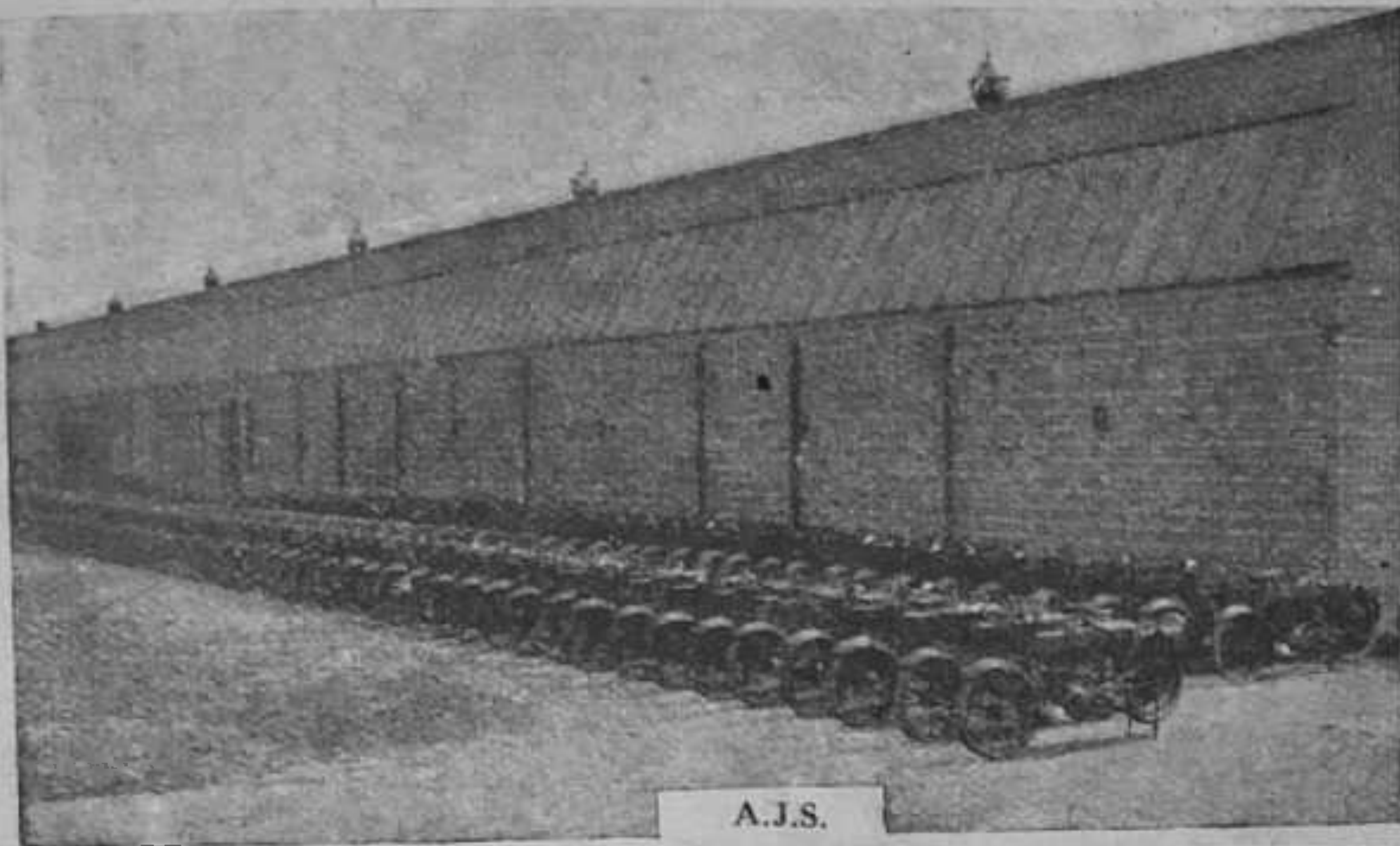
#### Germany's Motor-cycling Strength.

ACCORDING to some statistics supplied by a German technical journal, the number of motorcycles possessed by the Huns at the outbreak of war was 20,335. Apparently Fritz preferred gun-making to motor cycling.

#### Millions (!) of Lady Motorcyclists

FROM the London "Evening News": "A cycling authority says millions of girls now ride motorcycles, mostly for short-distance work." Millions! Think of it, and only 30,000 petrol licences issued. Who is this intelligent "authority"?





A.J.S.



B.S.A.



SUNBEAM.



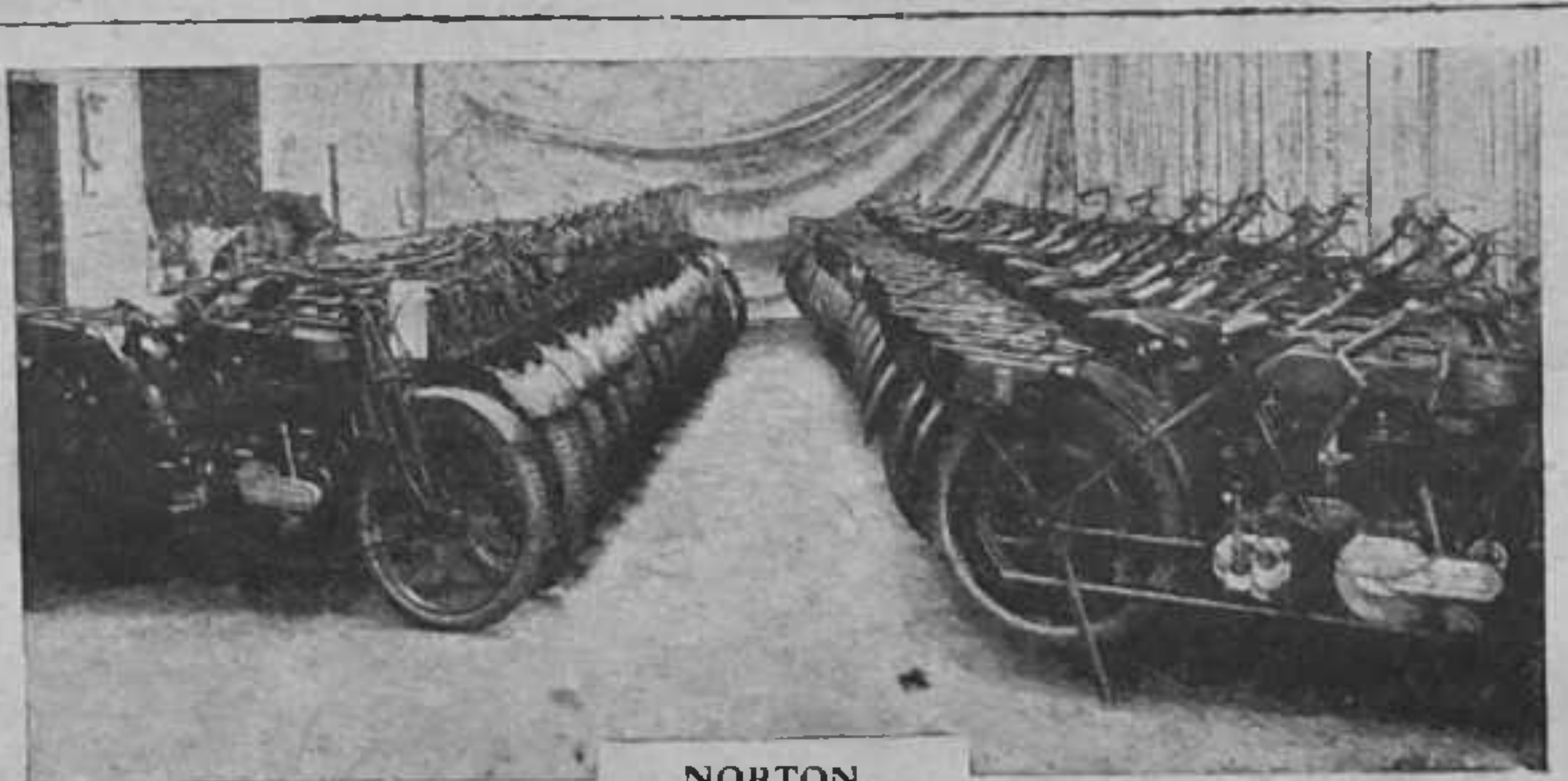
TRIUMPH.

## ASK YOURSELF WHY

A.J.S., B.S.A., SUNBEAM, TRIUMPH, NORTON, and many other makes of motor cycles supplied to the British and Allied Governments for use under the worst imaginable conditions are fitted with

# DUNLOP

RUBBER-STUDDED NON-SKID MOTOR-CYCLE TYRES!



NORTON.





"Count the Indians  
on the road."

**HENDEE MFG. CO.,**

"INDIAN HOUSE,"

366-368, EUSTON ROAD, LONDON, N.W.

Telephone—Museum 1648.

Telegrams—"Hendian, Eusroad, London."

AUSTRALIA—

109-113, Russell Street, Melbourne.

CANADIAN WORKS—

12-14, Mercer Street, Toronto.

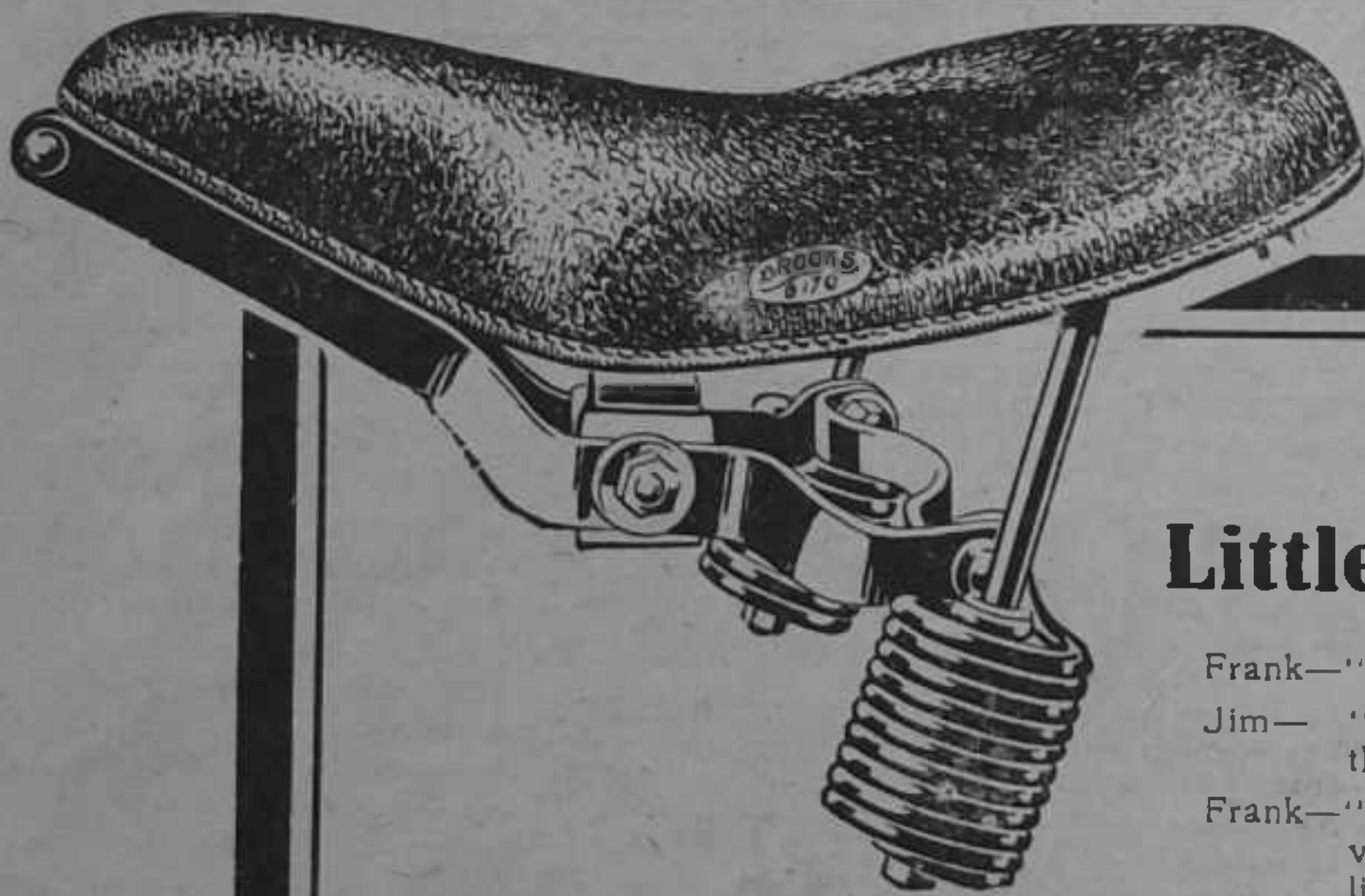
# Indian

AFRICA—

Indian House, 127-9, Commissioner  
Street, Johannesburg.

Indian House, 579, West St., Durban.

Indian House, Strand Street,  
Port Elizabeth.



## Little Saddle Stories

Frank—"Just got back, Jim?"

Jim—"Yes, had a fine tour—fine weather  
throughout and feel as fit as a fiddle!"

Frank—"Well, you're a marvel! I can't do it,  
vibration does it, and after a trip  
like yours, I'd want a rest cure!"

Jim—"Ah, I used to be like that, but since  
I changed my saddle, it's all changed."

Frank—"What's the make?"

Jim—"It's a

**J. B. BROOKS & Co., Ltd.,**  
49, Criterion Works,  
BIRMINGHAM.

# BROOKS



# A Demonstration of Gas-driven Motorcycles.

All Types of Cars and Lorries Shown Also.

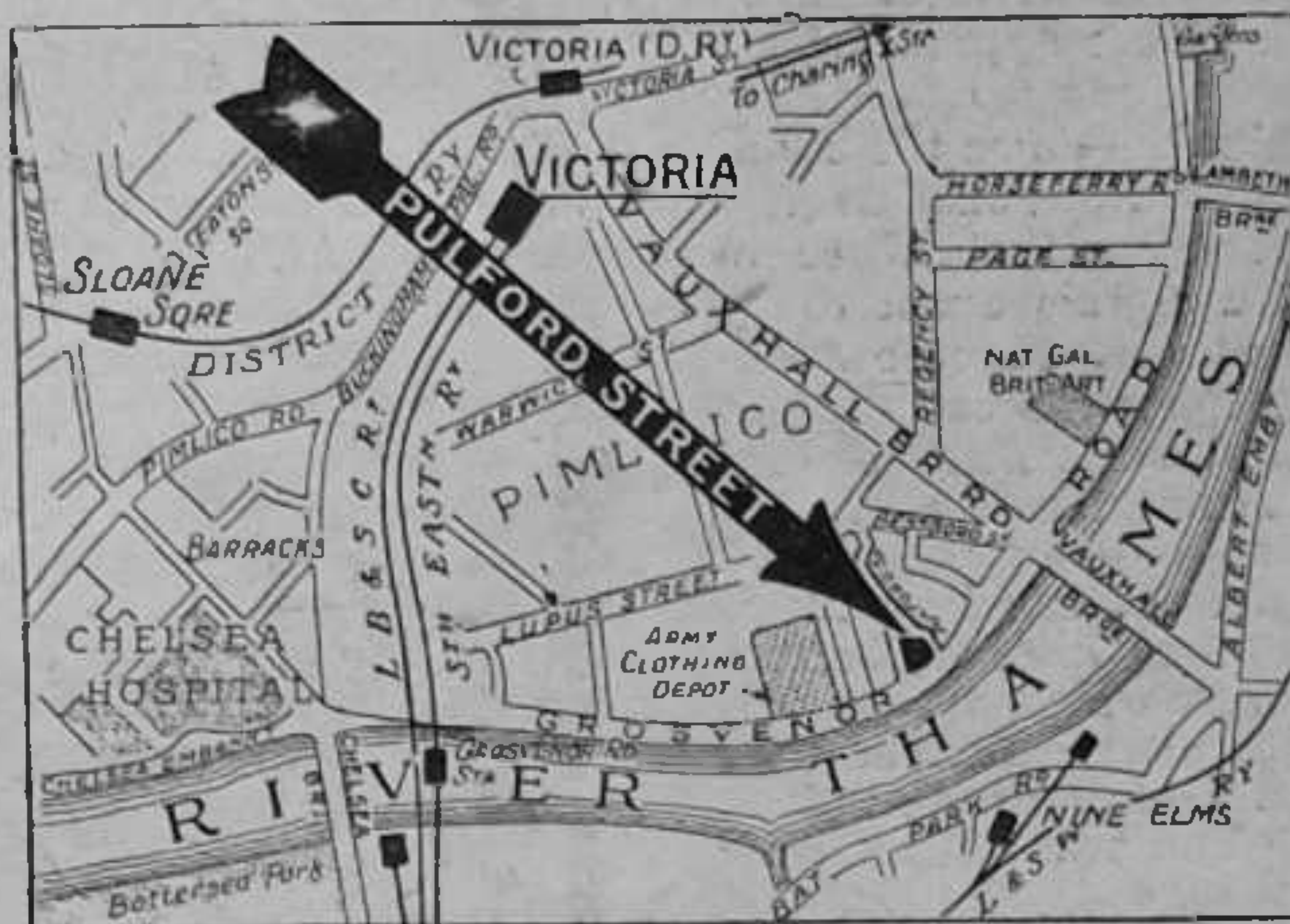
A DEMONSTRATION of motorcycles, cars and lorries converted to coal-gas will be held at Messrs. John I. Thornycroft's Commercial Vehicle Repair Depot and Garage, Pulford Street, Grosvenor Road, London, S.W., at 2.30 p.m., to-morrow (Wednesday), and all motorcyclists who are interested in the necessary alterations in order to run their machines on coal-gas should make an effort to be there. Cards to admit the bearer to this demonstration can be obtained from "The Commercial Motor" Gas Demonstration Dept., 7-15, Rosebery Avenue, London, E.C. 1. We are obliged to limit admission to invitations, owing to the restricted space available. Those interested should apply for tickets immediately, as the event takes place to-morrow.

There is every indication that this event will prove to be historical in the annals of motor cycling. It marks an era in a new development, as important

as the very first motor show, for many experts hold that the use of gas for propulsion is something more than a war measure.

Our own gas-driven Zenith and several other machines will be exhibited, so that interesting information regarding the necessary fittings to run on gas will be available. This Zenith is giving us no trouble whatever, and is of the greatest service to us in our ordinary business, running on gas solely.

We hope that the owner of the Moto-sa-coche who has fitted cylinders holding gas at pressure will be able to lend his machine for the demonstration, while other pressure gas systems will be shown, we expect. The flexible, rubber and canvas container holding gas under moderate pressures—built like a pneumatic tyre—is still a possibility of the future, but all the available systems can be seen at this demonstration.



How to get to the venue of the demonstration of coal-gas driven vehicles to-morrow.

## GAS TOPICS—NEWS AND COMMENTS.

The Chelmsford Corporation Gas Committee are supplying gas for motor vehicles at a charge of 5s. per thousand cubic feet.

Bournemouth's gas-filling facilities include no fewer than eleven depots within a comparatively small radius from the town where re-charging can be carried out.

The South Metropolitan Gas Co. is installing 2 in. gas pipes at 11 stations in their area for the purpose of charging gas bags. The price is 3s. 1d. per 100, plus a filling fee of 6d., irrespective of the size of the container.

Messrs. Andrew Barton Bros., of Beeston, have designed a two-wheeled trailer for the purpose of carrying a large gas bag as a reserve supply for cars. We see no reason why this proposition should not be quite feasible for motorcycles as well.

In drawing attention to the well-known circumstance that petrol in America is termed "gasoline," a contemporary asks "why?" As a matter of fact, nine out of ten Americans simply refer to motor spirit as "gas," which leaves us wondering what they would term coal-gas, if its use on motor vehicles in the U.S.A. were adopted.

That the South Suburban Gas Co. are not sufficiently enterprising to run their large fleet of motor vehicles, including side carriers, on coal-gas, but are still using liquid fuel, seems to afford another journal some consolation for the isolated position it occupies in this matter. But think what the gas company is losing in running costs, which gas would reduce enormously.

According to a letter sent to the Robin Hood Motor Gas Holders, Ltd., in answer to a query from them to the Ministry of Munitions, there is no present intention of restricting the use of coal-gas for motor vehicles.

The A.A. and M.U. have been in communication with the Ministry of Munitions regarding the use of coal-gas. The net result is a statement that coal-gas is not a petrol substitute, and a promise to inquire into whether the unrestricted use of gas for private motoring should be permitted.

It is very nearly possible to go the whole distance from Worcester right through Birmingham and Derby to Sheffield on coal gas. The longest distance is 21 miles, between Derby and Chesterfield, and there is very little doubt that Alfreton will fall into line and supply a charging station to fill in this gap.

Birmingham is establishing charging stations in the middle of the city. The whole of the Birmingham district has been organized so that no one need be more than a few miles away from a charging station. At the same time the gas committee have declined to afford facilities to local garages for supplying gas to private owners.

The London "Evening News," the comments of which journal on pleasure motoring have been rather amusing, has published an article by Professor Long pointing out that the use of gas, where it is cheap, should be encouraged more than ever during the war, because its manufacture involves the output as by-products of the land fertilizing sulphate of ammonia, which is "potential bread." Only recently the "Evening News" called the attention of the Coal Controller to the circumstance that pleasure motorists were using coal-gas.

### A New Fuel.

EXPERIMENTS have been conducted in New Zealand with a view to obtaining a fuel from pine resin. The yearly production of resin is 8000 tons, and this yields 20 to 30 gallons of crude oil per ton.

### Misleading Dora.

DEFENDING a charge of mis-use of motor spirit at Otley recently, a solicitor remarked that no one could understand the various orders as to motor spirit; they were in a state of hopeless confusion.



# Motor Cycling Extraordinary at Los Angeles.

(FROM OUR AMERICAN CORRESPONDENT.)

ON 2nd September 350 motorcyclists met at Seal Beach on the ninth annual run-to-the-sea of the Los Angeles Motorcycle Club. The riders left the clubhouse at 9 o'clock in the morning and, after a delightful foggy-weather spin over 32 miles of paved highway, arrived at the beach resort approximately an hour later.

First came the two-mile speed race—down the beach for a mile and back again. Fred Ludlow, on a Harley-Davidson, was the winner, covering the course in 1 min. 45½ secs. Ludlow has won this event every year for the past four years, but each time on a different make of machine. A jumping contest was not fought out with the enthusiasm that has characterized it during the last few years. It is hard on machines and rather dangerous, and no one seemed inclined to try to beat the record of 51 ft. established by H. B. Nix last year. Nix made an effort himself, but he was riding a new Henderson with which he was not thoroughly familiar, and he admitted that he was "scared to let her out." His former record of 51 ft. was made with an Excelsior. The surf rolling over the course, by reason of an unusually high tide, also hampered the competitors. Ralph Sullivan, on an old White Thor, cleared the sand for 42 ft. 2 ins., and was pronounced the winner. He carried off a brand new pair of Firestone covers as the first prize.

## A Deep-sand Race.

If you can imagine a motorcycle speed contest taking place where no car, whatever its horse-power, would be able to move, then you have an idea of event No. 3—the deep-sand race. The course was for two miles—up the beach a mile, turn around in a big circle, and back again. Roy Artley—the speed-demon who broke the record from Canada to Mexico—tried it first. He covered the bottomless course at terrific speed, and, to all appearances, was certain to win the first prize, as he came down the home stretch. He was less than 40 yards from the finish line when his rear tyre, unable any longer to withstand the terrible twisting side strains, flew from the rim, and Artley did a quadruple somersault almost to the tape. He was uninjured.

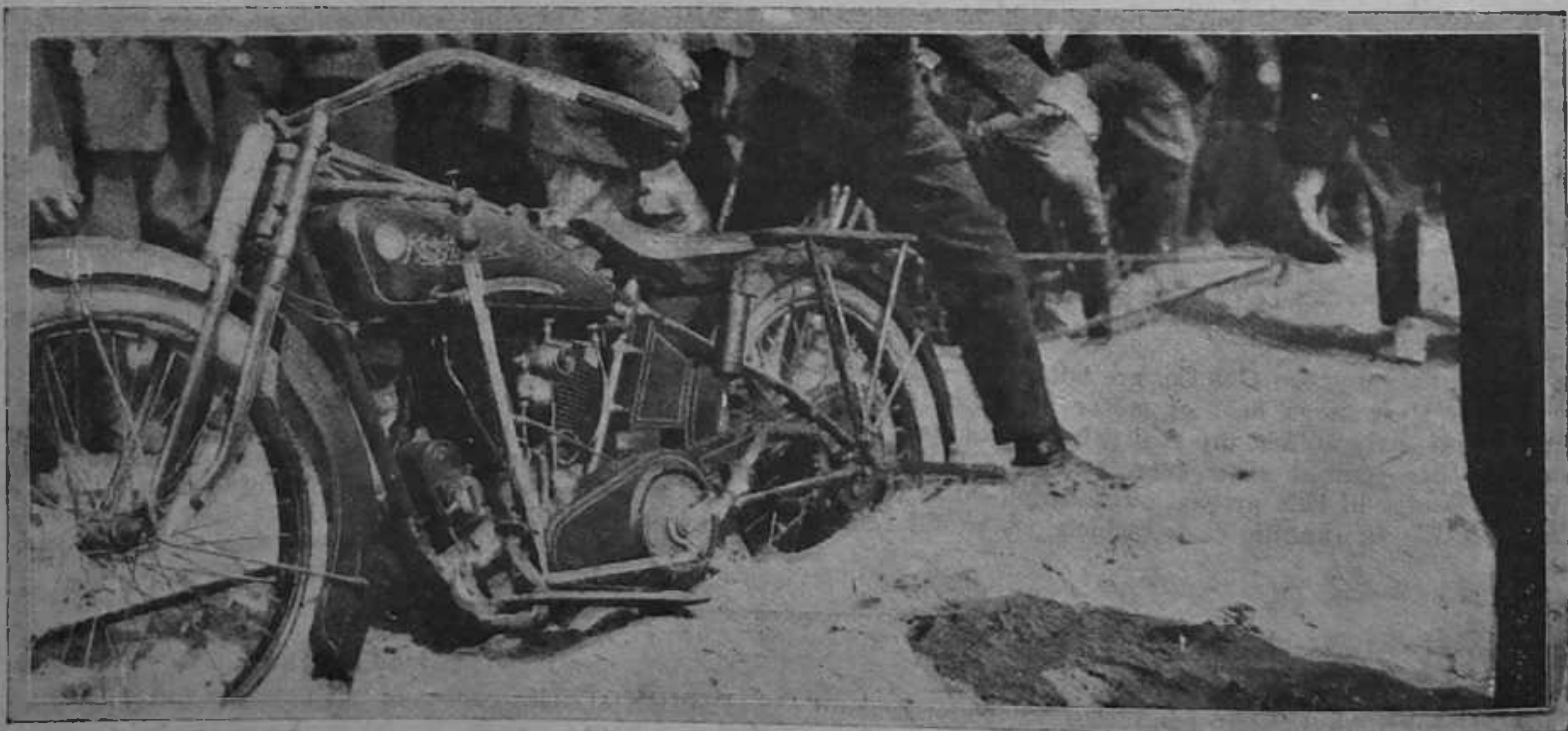
H. B. Nix, on his Henderson, tried it next. He

squirmed along through the sand for a quarter of a mile, travelling almost as far sideways as he did ahead before he came to grief. E. C. Hoffman, on a Big Ex., was the next man. He wriggled along like a snake for a few yards, fell, got up again, rode ahead, fell, got up again, and, after several more rolls in the sand, got back to the tape in 3 mins. 1 sec. C. Gustafsen, on a Henderson, gave the crowd some thrills by covering the course in 1 min. 24½ secs. Ray Thompson, on a brand new Harley-Davidson, got back in 1 min. 23 secs., but was disqualified because he rode the hard sand near the water's edge. A number of other riders tried it, came to grief in more or less spectacular fashion, and established various records. Then Wells Bennett electrified the crowd by tearing up the beach and back, covering the course in 1 min. 8½ secs. No one else approached Bennett's time, and he was therefore pronounced the winner, and carried off first prize.

## A Motorcycle Tug-of-War.

The next event was the most striking ever witnessed at a motorcycle contest—a tug-o'-war between two teams of six machines each. The competitors were hitched at intervals along the two ends of a stout 150-ft. Manila cable, and as the starter's pistol cracked all the riders pulled in their clutches and the machines began to roar. Sand flew high in the air, and the machines see-sawed back and forth along the strand. One by one the machines dug themselves into the beach until they could pull no more, and at the end of 10 minutes the riders had all shut off their power. The winning team, which was commanded by Wells Bennett, had dragged the other team just 3 ins. Each member of the victorious team was awarded a handsome pair of pigskin puttees. The rest of the day was devoted to picnicking, dancing, surf bathing and other recreation.

At 3 in the afternoon Blick Walters thrilled the onlookers by riding his Henderson over the roller coaster. This is a feat that requires a cool head, skilful riding, and an abundance of nerve, for a spill or stalling one's motor on one of the humps would surely mean disaster. Then in the evening, after a fireworks exhibition, there was the run back again to town by artificial light.



How the machines dug themselves into the sand in the tug-of-war.



## A GREAT AMERICAN MOTORCYCLE SPORTS MEETING.



The riders on the way to Seal Beach are shown in the top illustrations.—Next comes the motorcycle tug-of-war, which proved a most exciting event, between teams of six motorcycles each. The machines dug themselves into the sand.—Blick Walters riding the roller coaster. Note the four-inch sleepers between the rails, which made the feat perilous.—A competitor nearing the finishing line in the deep sand race.



# DISTINCTLY CONCERNING MOTORCYCLISTS.

## Personal Pars on Well-known Riders.

time. He means to make the attempt again soon.

ROBERT VAUGHAN, the sales representative for Great Britain for Mead and Deakin, the well-known motor engineers of Tyseley, Birmingham, chiefly known as the makers of the Canoelet sidecar, had a marvellous escape during one of the recent raids, when a bomb fell in the roadway near a West End hotel. A man standing by his side was killed, but he, luckily, was just opposite



A. J. Luce, a famous Zenith rider, now Lieutenant, A.S.C., in racing helmet.

A. J. LUCE, now Lieut., A.S.C., stationed at Lee, writes me concerning a paragraph with reference to Gordon Bell practically always riding his B.A.T. at Brooklands. Luce states that Bell only rode his B.A.T. twice, and that was owing to his having previously received injuries through falling off his machine. He also states that in 1911 alone he won over 20 firsts at Brooklands. Perhaps he is mistaken in the year, as I am informed by Mr. T. W. Loughborough, the secretary of the B.M.C.R.C., that he does not see his name mentioned once in the records of the races for that year. He also takes exception to my statement that he ran into a traction engine, and wishes it to be known that it was something larger, viz., a steam roller. *Palmam qui meruit ferat.*

MET E. B. Ware on the road last week on a "flivver." He is still carrying on the good work of perfecting motorcycle engines at the J.A.P. works at Tottenham, where he is engineer in charge of the Experimental Department. They have several very interesting propositions for after-the-war engines, including two entirely new type V twins, one having a long stroke which has given excellent results in Matchless and Morgan machines. During a tour of the works recently, I saw several single-cylinders of a special design on the stocks. These are used for making pressure for filling the air compressors on our big howitzers, which shows that wherever you go you cannot get far away from the motorcycle.

B. E. KENNEDY, who for a long time was a D.R. in France, and who by the way won the D.C.M. on account of conspicuous bravery under heavy fire, has just made an attempt to beat the train record for 350 miles between Toronto and Montreal on a Henderson and sidecar. The previous road record was made by a big car under perfect conditions, which did the distance in 11 hours. Bad luck followed Kennedy all the time, and after bursting a tyre he ran into a cloud-burst and then surrendered on account of running out of precious liquid after doing 125 miles in record

B10



"Canoelet" Robert Vaughan, who had a narrow escape in one of the recent air raids.

one of the main pillars of the door, which apparently took the full force of the explosion, and in consequence saved his life. He tells me he has stayed at the hotel a few years, and that the Huns have not even now frightened him enough to make him change.

VICTOR WILBERFORCE is now O.C. at a R.N.A.S. station, and was in town lately. Very few would recognise the old rather thin "Wilbur" in the present robust Squadron Commander.



The Bashall family of motorcyclists, the masculine members, from left to right, being "Bizz," Harry, and Aubrey.



Jack Haswell, the foremost amateur single-cylinder exponent, now a despatch rider.

THERE are few indeed who recognise in Despatch Rider J. R. Haswell, 68959, the foremost amateur single-cylinder exponent of 1910 and onwards. I believe it was in 1910 that Jack Haswell made his debut on a Triumph, and he competed in all the trials of that year for the mere love of the game, for Haswell was ever an amateur and abhorred shamateurism in its entirety. He raced against the professionals with surprising success, and by degrees he graduated to Brooklands, where his clever riding gained for him the admiration of all the great track's patrons. When all eyes were focussed on the duelling for records between the Triumph and Rudge in 1911 and 1912, when the records of yesterday were made only to be broken to-day, Jack Haswell was in his glory, and for a strenuous six-hour ride he was master of all the trade riders. In the 1912 Senior T.T., he obtained second place, the honour of being the first single to finish and the first private owner, all went to Haswell, and right well he deserved it. Only those who experienced the difficulty of steering and riding the particular model of that year which Haswell rode can fully appreciate the greatness of that ride. Haswell is at present in the R.F.C., despatch riding on a P. and M., but he often longs for his old bus and the old days. To friends on both sides of the Channel, Jack sends his kind regards.

MET Dr. Smith on the Brighton Road during the week-end. He will be remembered by most of the Modwena clientele as a very keen watcher of the races, although not taking part in any of them. Even doctoring is not all honey now he told me. He was then on a 100-mile visit to a patient in the country, which was inaccessible by train, on his big T.T. 8 h.p. red Zenith. His wife is also a very keen rider of a Scott.

OCCASIONALLY one hears of R.N.A.S. officers from the Air Board at the Hotel Cecil leaving for Overseas. Such a case is Sub-Lieut. Vaughan Knight who rode the famous Chase "that didn't" in the last T.T. He has just received his sailing orders and is off to Egypt. THE A.P.M.





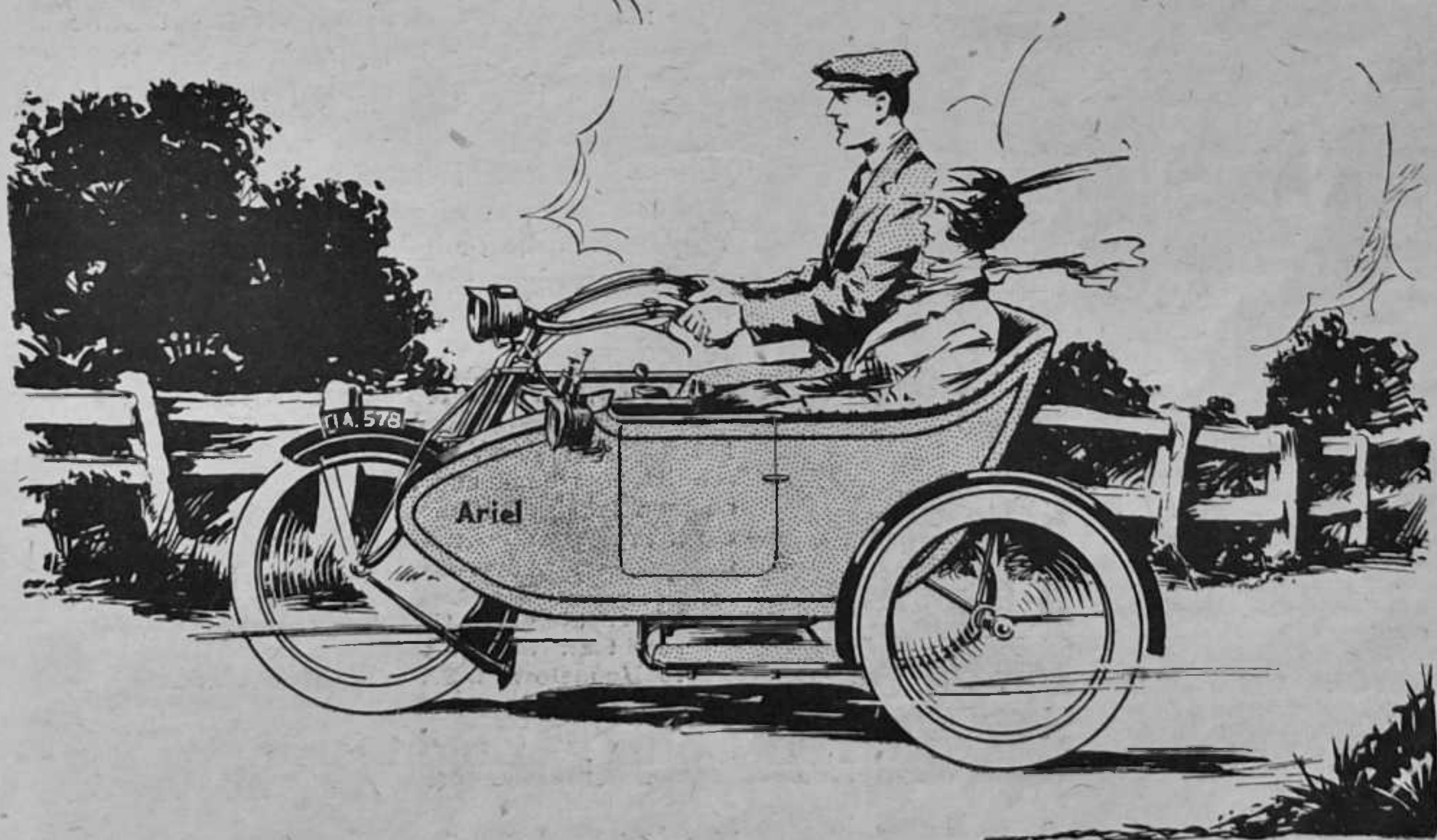
# Ariel Service

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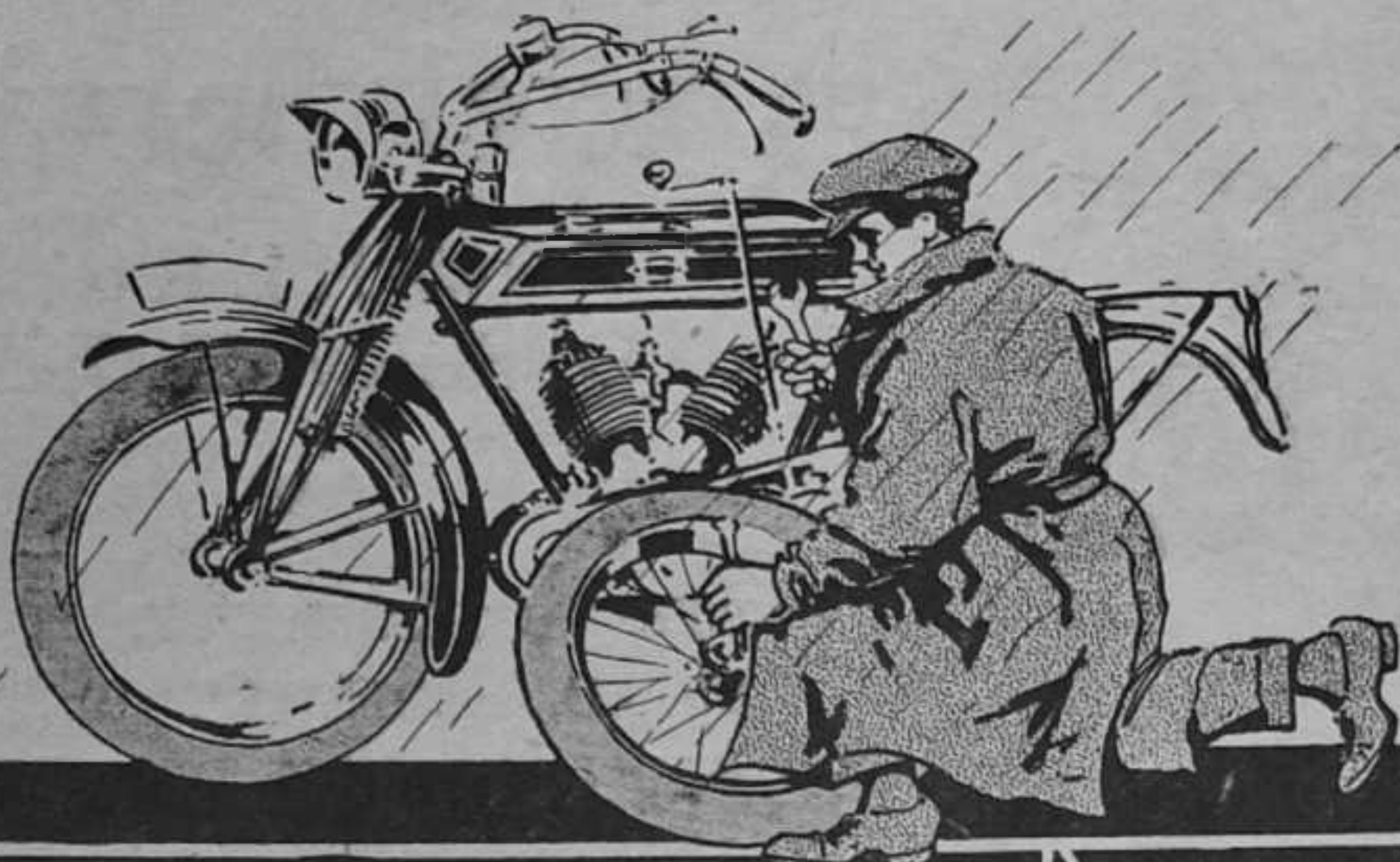
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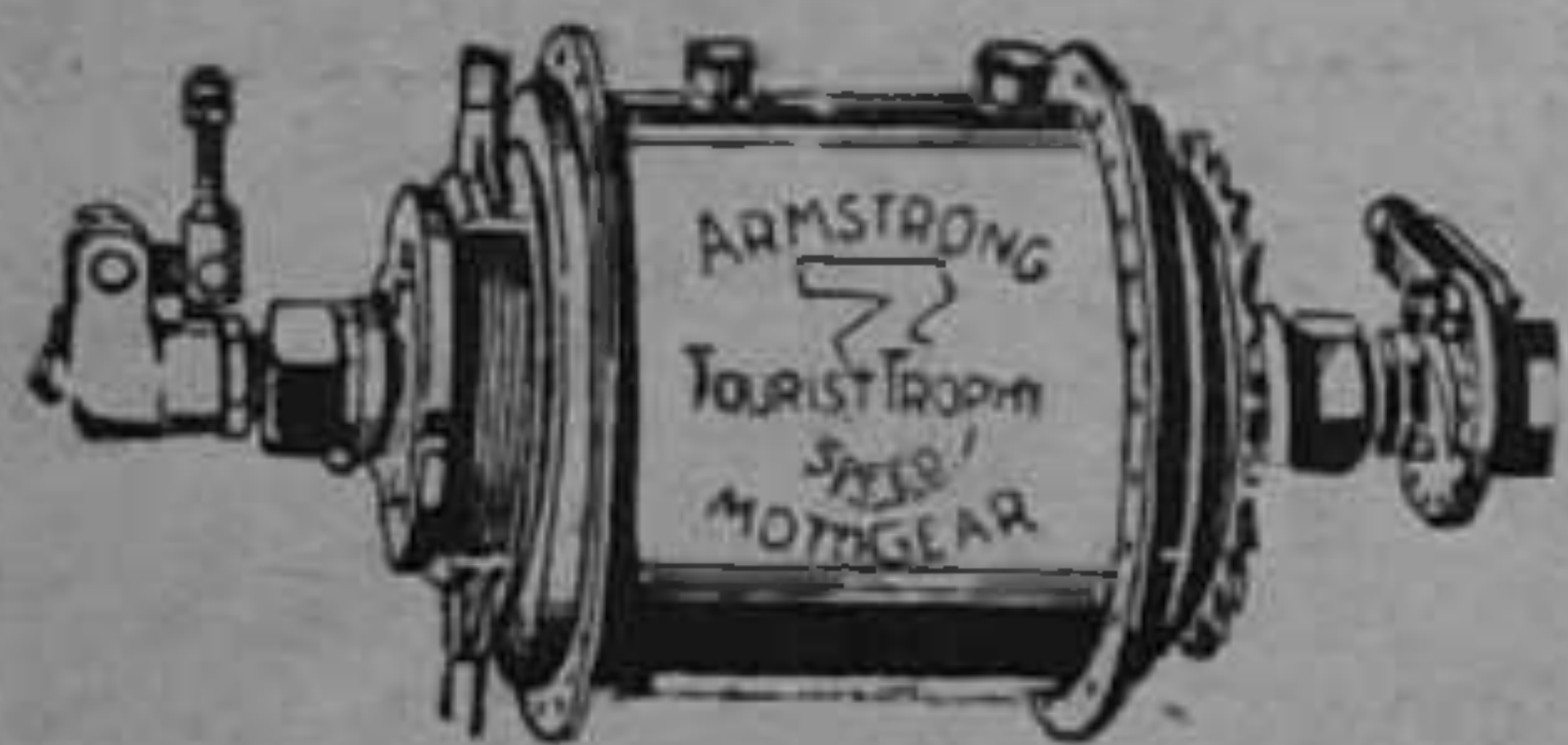
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PII





# Repairs



on the road and in the rain, just because the gear had been tinkered with by an amateur, need never be!

## WE ARE SPECIALISTS

in the repair of Sturmey - Archer and Armstrong Gears and have a complete stock of spare parts ready for immediate repairs.

There is no need to have a machine "hung up" on account of gear troubles. Callers can be supplied with any part from stock, or we can despatch by next post. Gears sent for repair can be finished with tested parts—the same as we are supplying to the British & Allied Governments.

**IMPORTANT.**—When sending wheels or gears, see that your name and address is plainly written on **two** labels. Remove all outside fittings, as clutch and gear controls, push rods, axle nuts, washers, etc. Advise us by post of despatch.

We repair gears thoroughly, and give a road test. Send wheels, clearly labelled, to Hounslow, L.S.W. Railway Station

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## THE OVERHAUL OF A HUB GEAR.

Some Useful Hints to Assist Those Whose Motorcycles are Fitted with a Sturmey-Archer Hub.

**T**IME and time again during the last few months we have been asked by correspondents how to overhaul or dismantle their hub gears. Although hub gears are not at present fitted to motorcycles, they were exceedingly common at one time, and a few hints on their working and adjustment would probably be useful.

The hub gear, if properly treated, can be kept in proper repair by any motorcyclist possessing a moderate amount of intelligence and the ability to undo a nut and do it up again. If the motorcyclist periodically cleans his gear and lubricates it with a thin lubricant he will find that it is quite a reliable fitting if correctly adjusted.

### To Remove the Back Wheel.

Disconnect the gear operator by undoing the nut marked "D" in Fig. 1, and withdraw the gear push rod. Remove the nut ("D," Fig. 2) holding the exhaust pipe to the chain stays; drive out the exhaust pipe from the silencer by tapping it lightly with a hammer on the vertical portion ("E," Fig. 2). Undo the rim brake and the chain; disconnect the clutch control by removing the cover ("A") of the quick-thread nut; withdraw the clutch push-rod; loosen

the quick-thread nut under "A" and finally by loosening the nut ("G," Fig. 1) the wheel will drop out. In nine cases out of ten the trouble with a hub gear is not in the clutch, and it is therefore important to remember that gear trouble can be attended to without disturbing the clutch mechanism.

### To Remove the Gear From the Hub Shell.

First remove the free-wheel mechanism ("A," Fig. 3) by taking off the cone ("B") and lifting off the chain sprocket ("C"), pawl-holder ("D") and ratchet ("E"). The balls and cage ("F") are next removed, also another locking ring and ball race underneath. Now turn the wheel over in order to remove the belt rim. This is done by undoing the cone which has been removed in Fig. 4 and levering off the ball retainer ("A") and the row of balls underneath. Hammer off the large locking ring ("A," Fig. 5) beneath the belt rim, and when this is fully unscrewed it will enable the belt rim to come right away. It is an important thing to remember that this locking ring is the only left-hand thread in the whole hub. After the belt rim has been removed, the complete gear will come out, as shown in Fig. 6. The gear itself is shown in Figs. 7, 8 and 9.

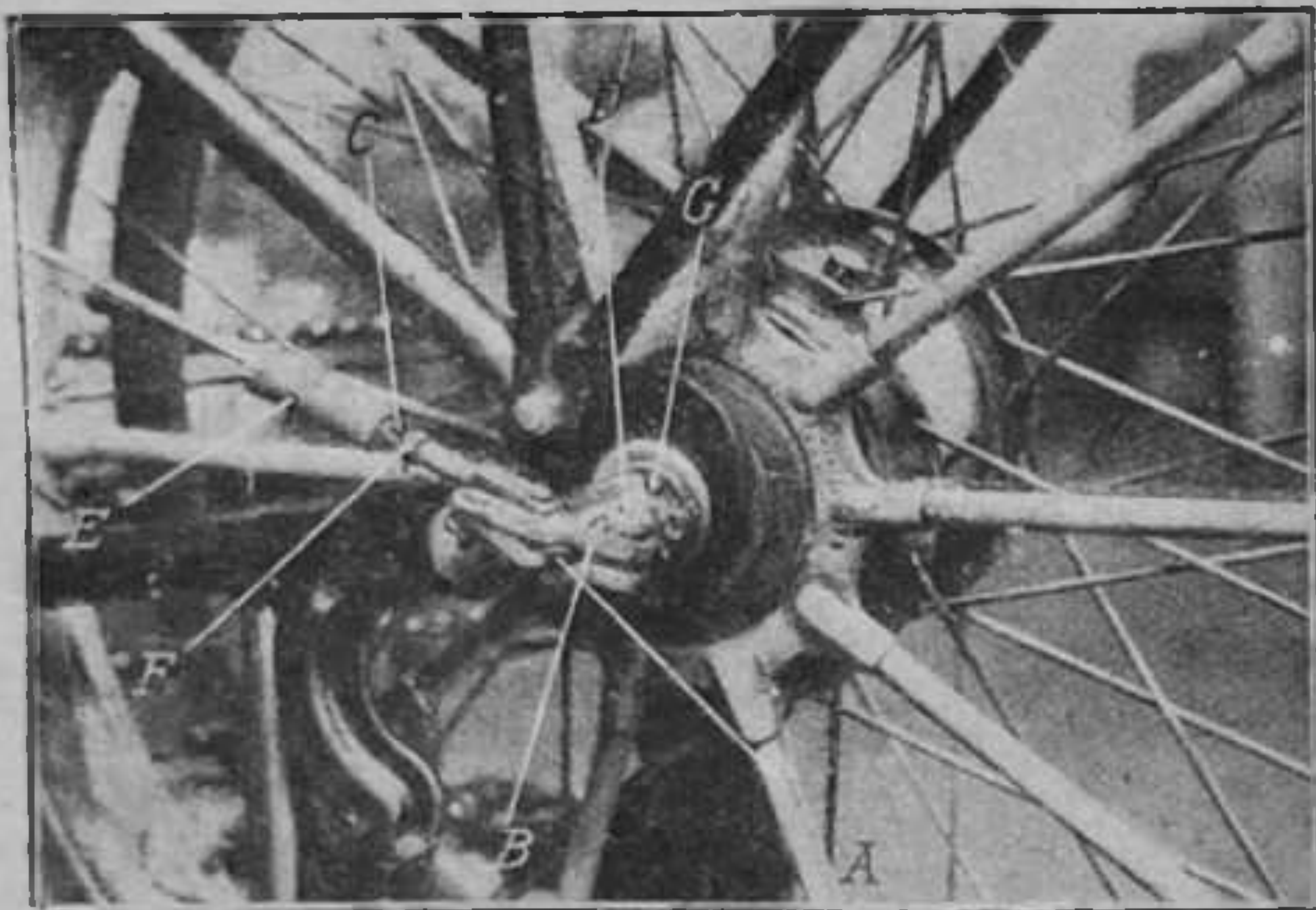


Fig. 1.—The belt rim side of the hub.

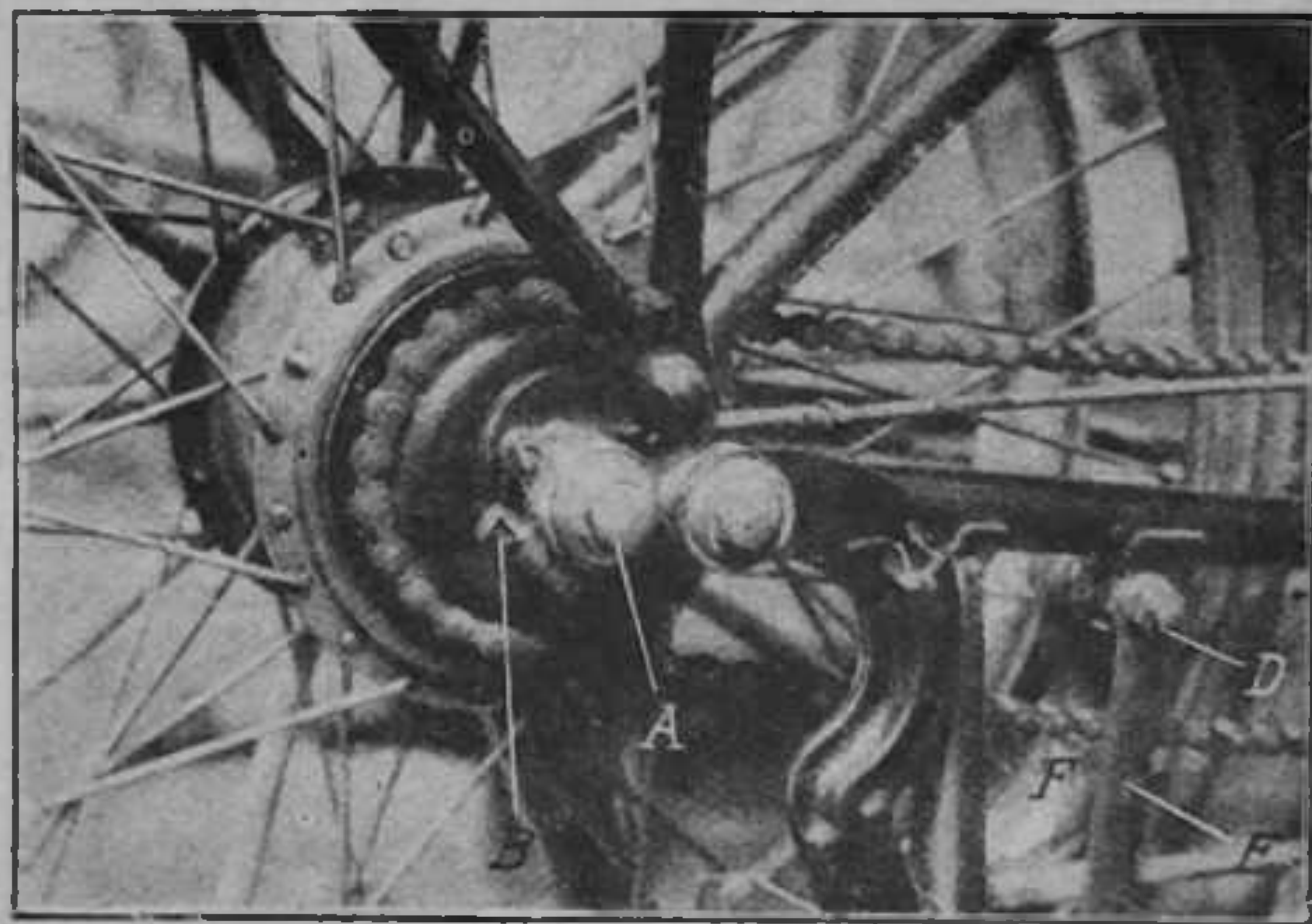


Fig. 2.—The brake rim side of the hub.

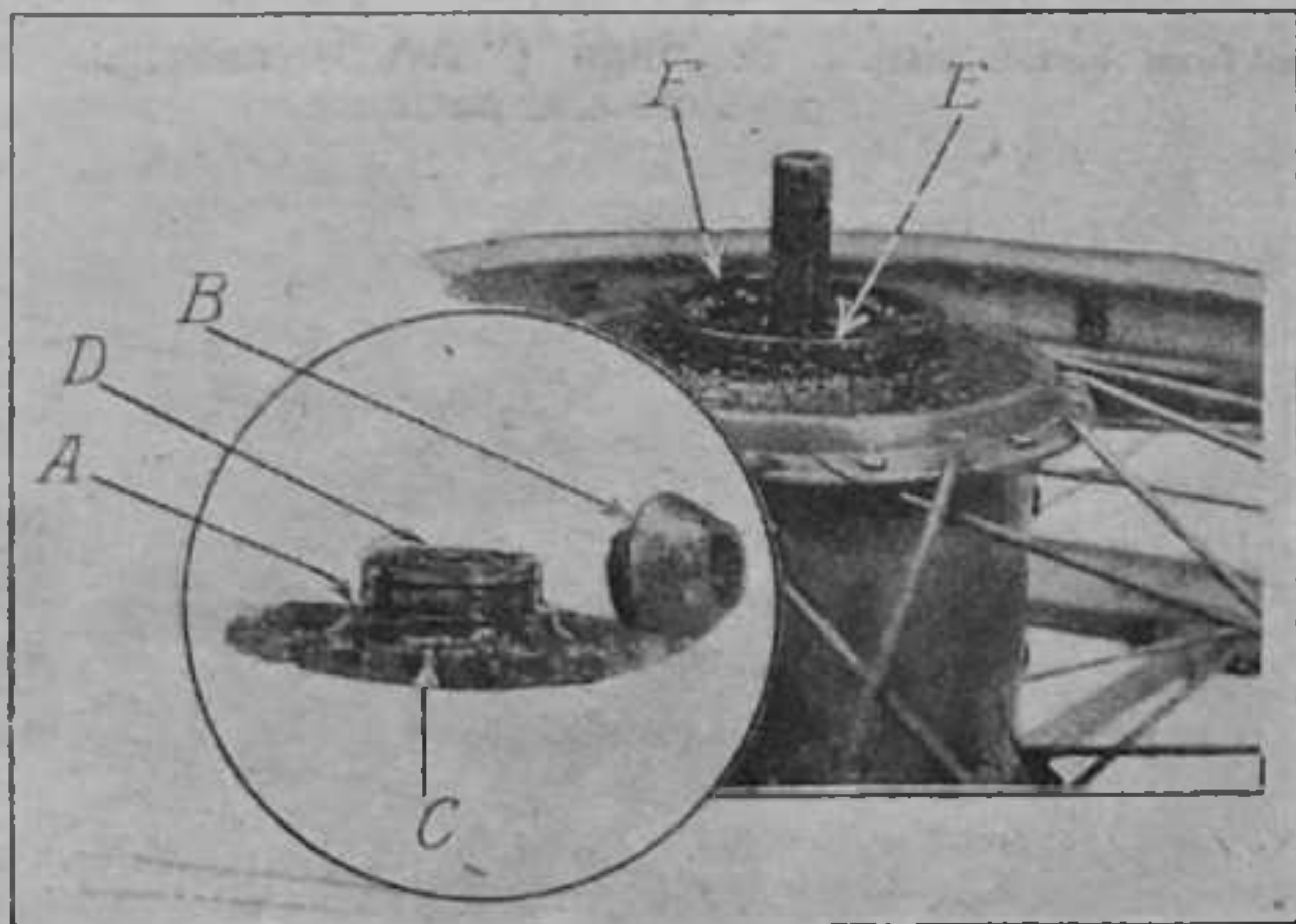


Fig. 3.—Details of the free-wheel mechanism.

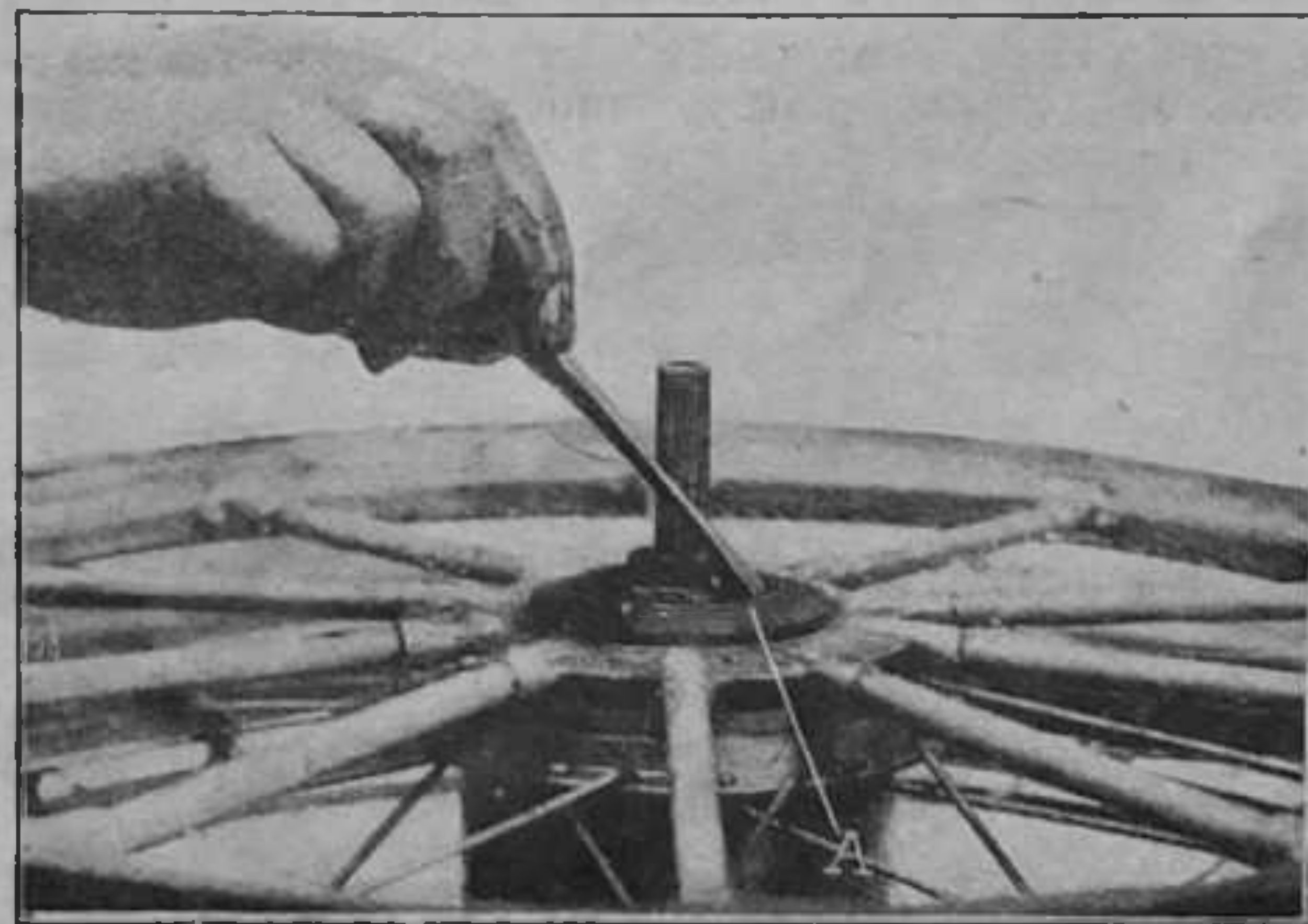


Fig. 4.—Levering off the ball retainer after removing the cone.



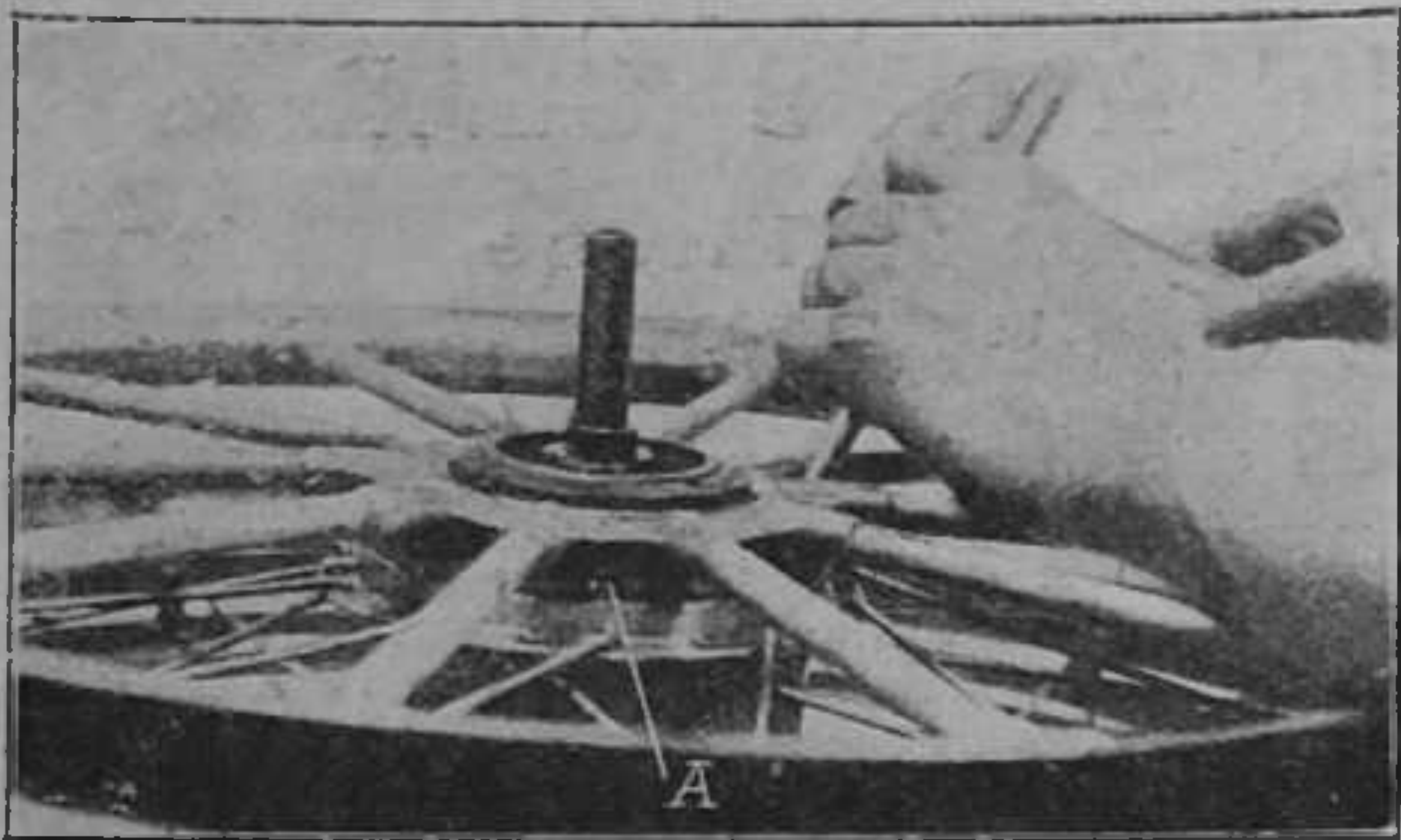


Fig. 5.—Hammering off the locking ring under the belt rim.

#### To Dismantle the Gear.

Remove the cotter ("A," Fig. 7), when the springs ("B" and C," Fig. 8) will force the sleeve ("D") off the shaft ("E"), and allow the whole system of sun and planet wheels to come apart. The usual troubles are then easily seen, and will probably be either planet wheels ("F"), broken ball races or possibly a loose belt rim. Should the wheel ("G," Fig. 8) require renewing, it can be taken off by undoing two grub screws ("H," Fig. 9) and unscrewing "J." When this is replaced great care should be taken that it is in exactly the same place. Should the belt rim have become loose through wear, it can be tightened by removing one or more of the washers shown at "K," Fig. 8.

A good tip for removing and replacing the clutch plates is to obtain a piece of pipe ("A," Fig. 10) in order to act as a thick washer. This is placed over the shaft, and then the nut ("B") is screwed down until all the springs are compressed. The plate ("C") can now be easily unscrewed, and the replacing of clutch plates is facilitated. When the plate ("C") is removed, as shown in Fig. 11, the clutch plates, of which there are 36, can easily be taken out. There are two types of plates, those marked "A" being attached to the hub shell by means of keys and those marked "B," engaging in keyways on the centre ("C"). It is a very good plan occasionally to remove these plates and

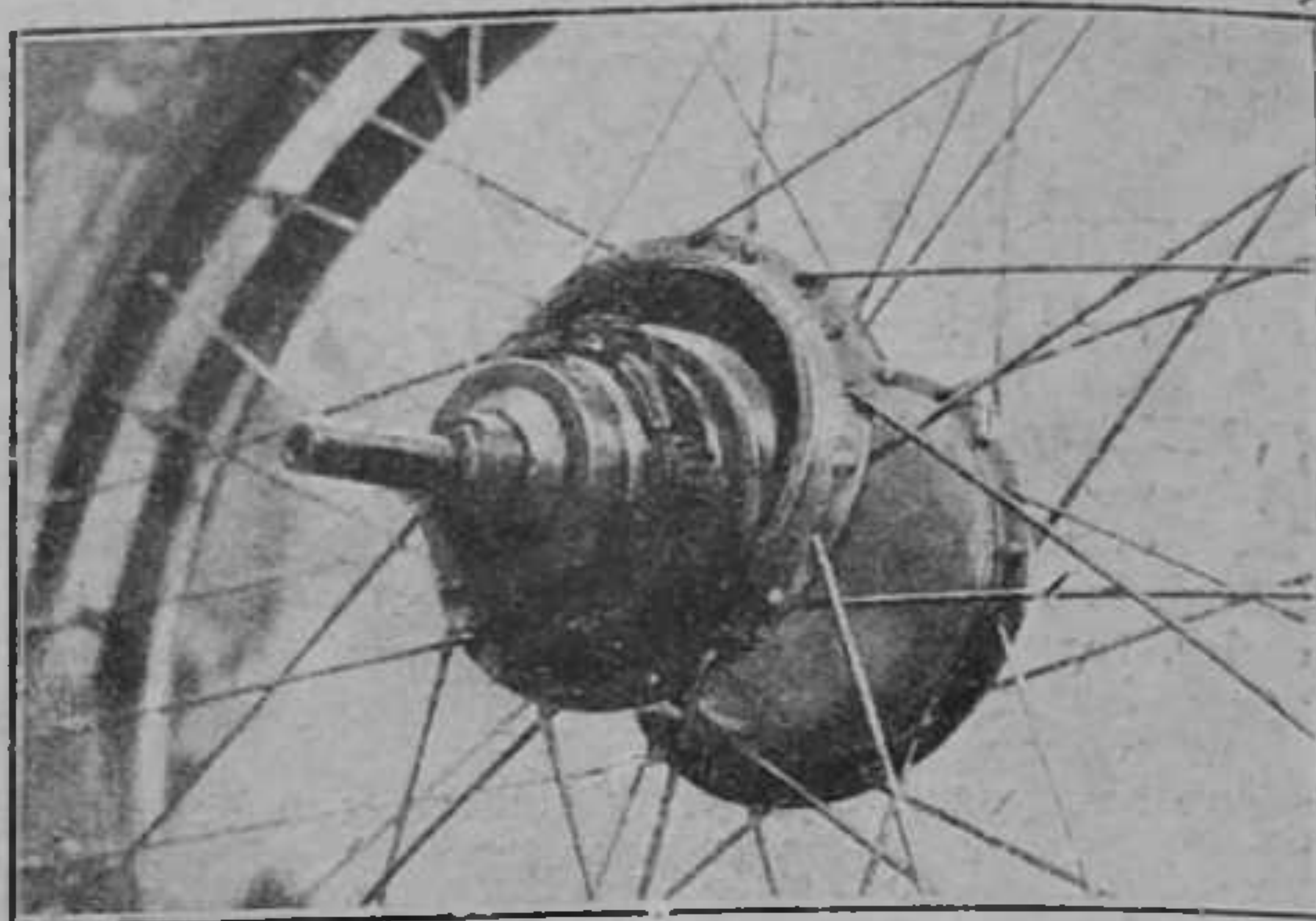


Fig. 6.—The gear is taken out from behind the belt rim.

thoroughly clean them with paraffin, as well as the clutch spring container, which is shown in Fig. 12, and is situated beneath the plate.

The clutch spring container may give a little trouble in re-assembling, but with the aid of grease this is more easily accomplished. Clutch slip on this particular Sturmey-Archer hub is not common, but if it does occur it is easily cured by cleansing the plate, or by fitting new springs.

Occasionally the free wheel for the pedalling gear goes wrong. This is illustrated in Fig. 13. The two pawls ("P") are forced outwards by means of eight semi-circular steel springs ("AA") and held in position by slots in the frame ("C") at the top, and by the circular spring ("B") at the bottom. These pawls very often wear out, and the springs are liable to break if much mud gets into the free wheel. The pawls are easily removed by inserting a knife blade under the frame ("C"), enabling the tip of the pawl to disengage from the slots. When new pawls are being inserted the lower tip should be pushed under the spring ("B") first, and then the top tip inserted in the slot by raising "C" as before. Replacing the springs ("AA") necessitates time and patience.

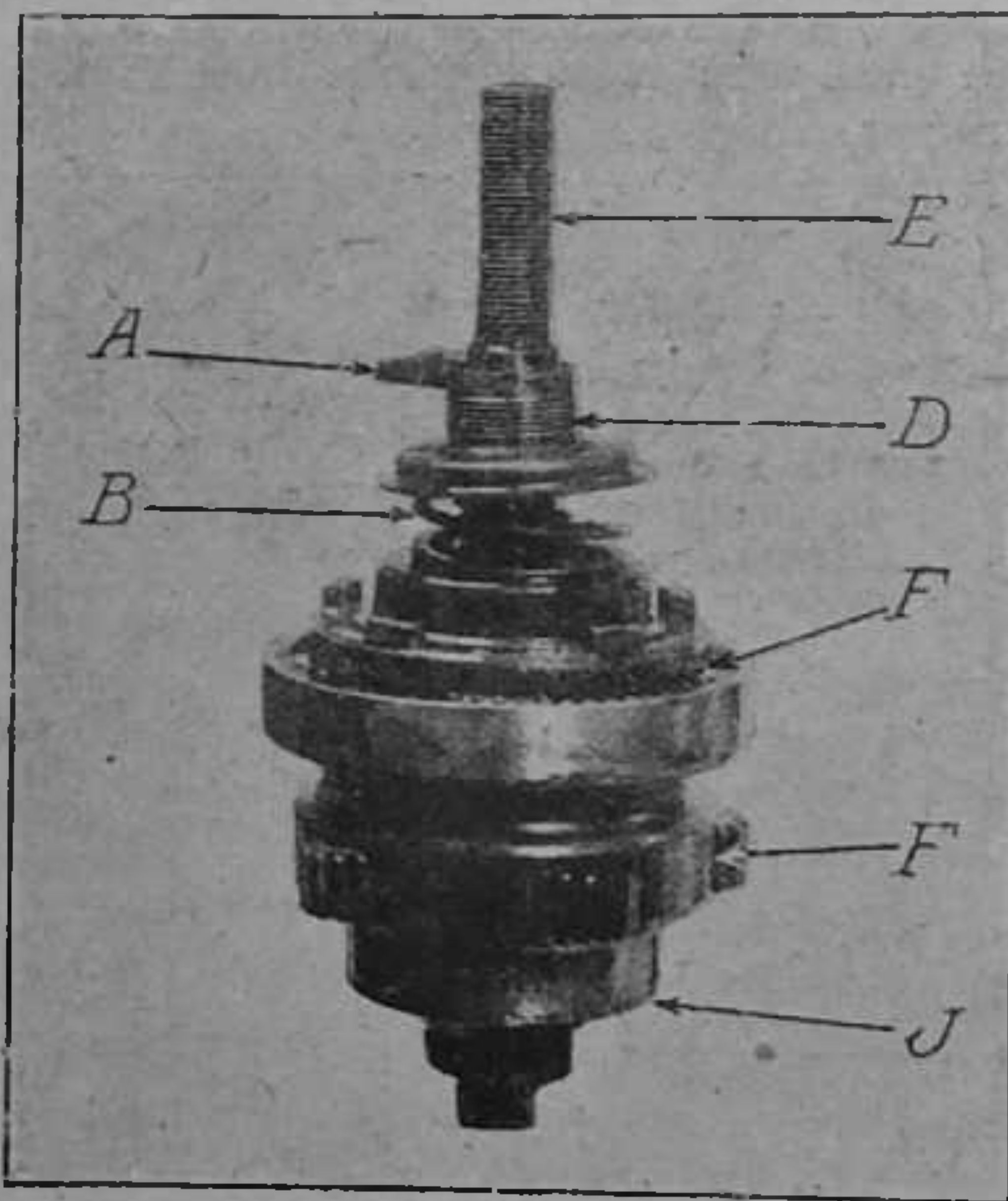


Fig. 7.—The gear removed from the hub shell.

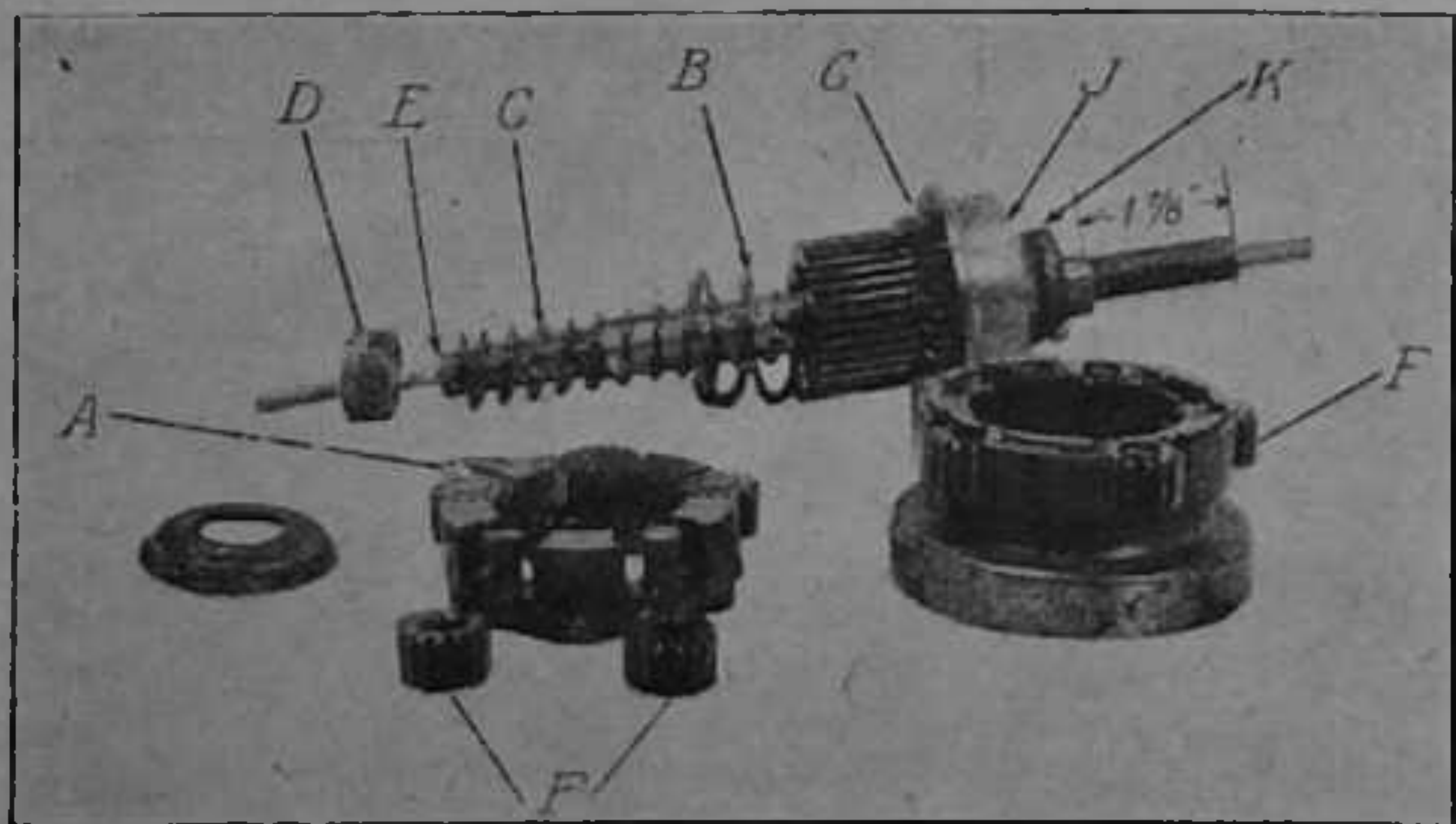


Fig. 8.—The gear dismantled.

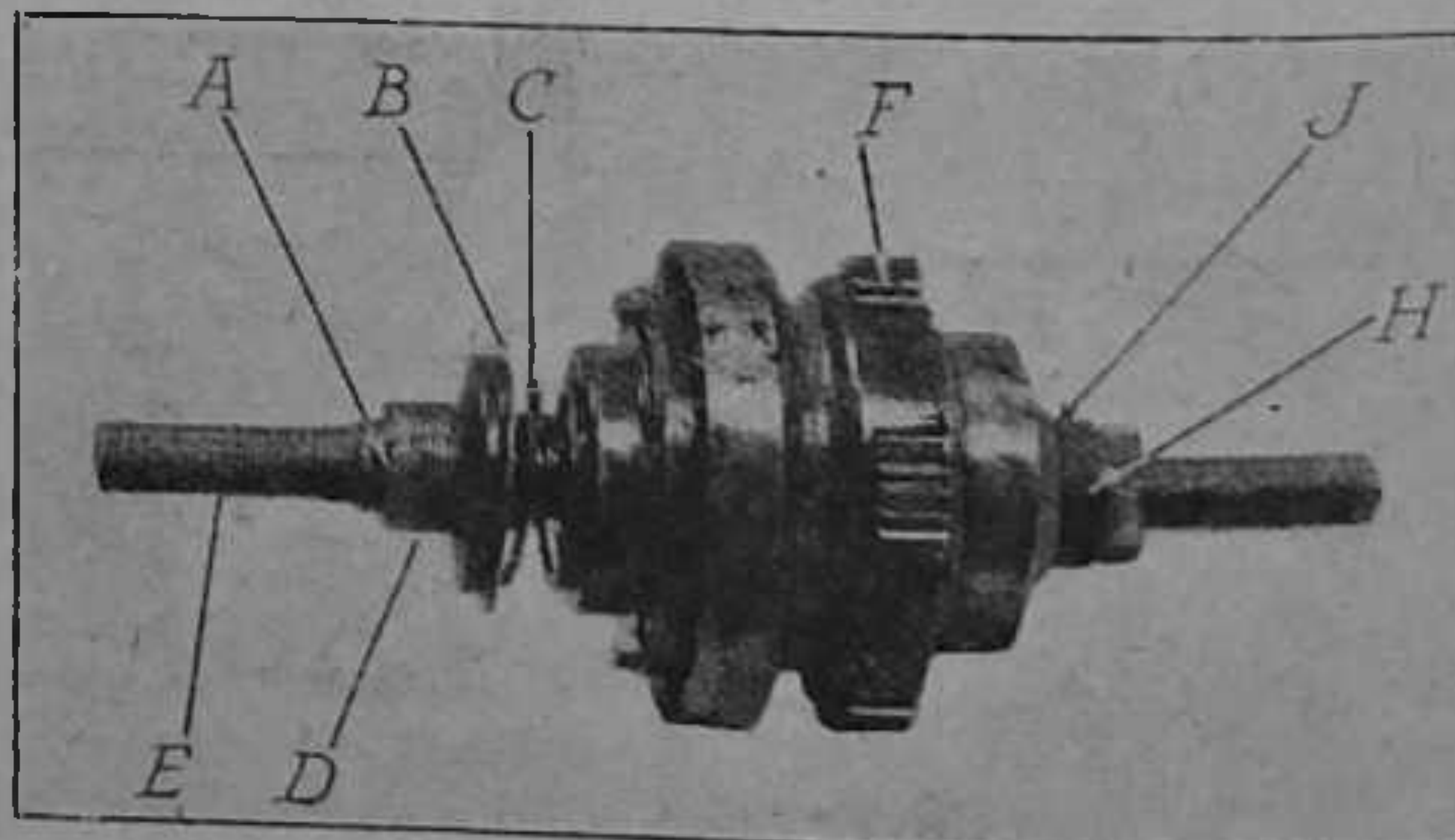


Fig. 9.—Another view of the gear details.



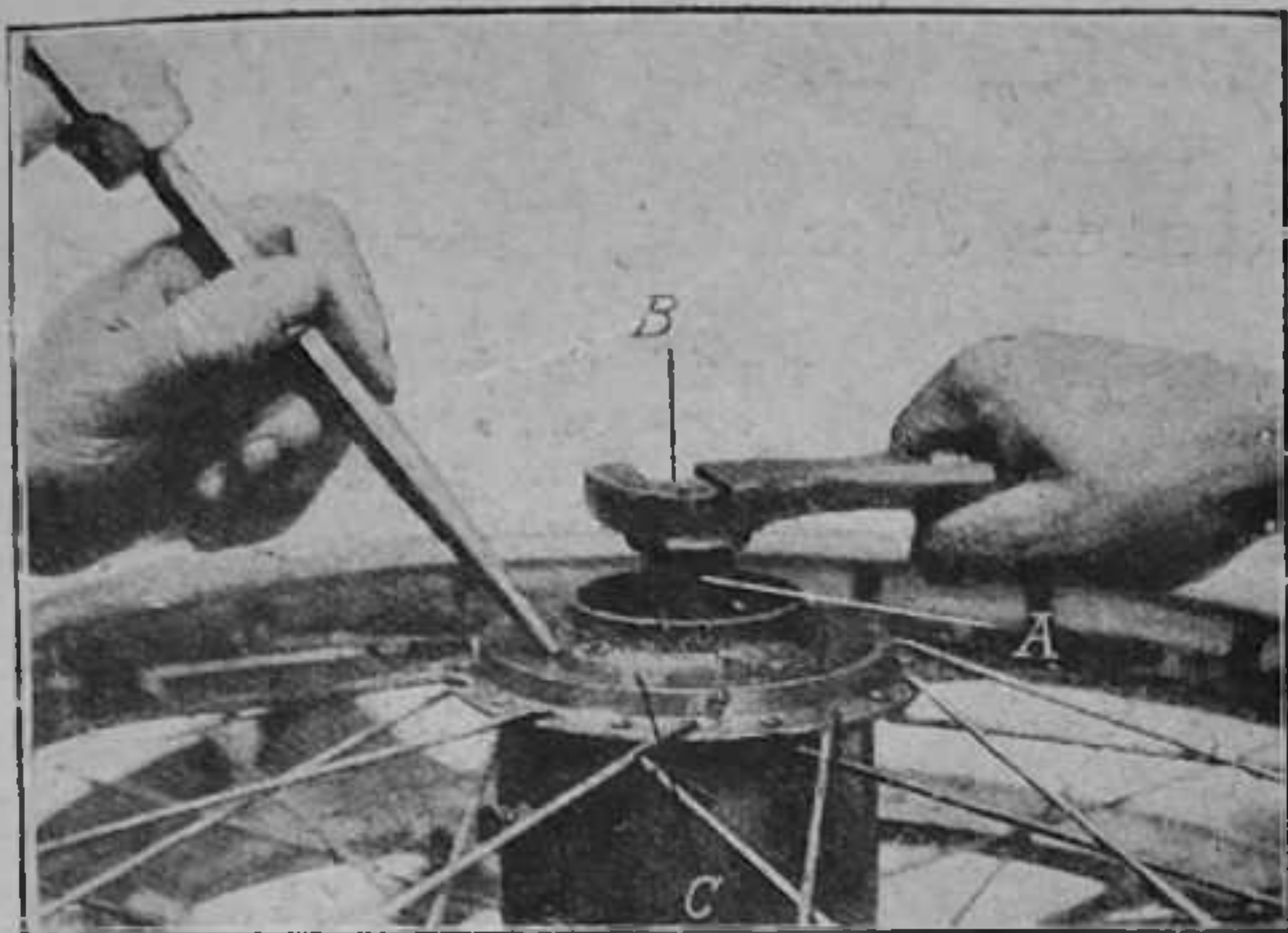


Fig. 10. - Removing the clutch plates is made easier by compressing the springs first.

### To Adjust the Gear.

Many people lose patience with their gears because they are not properly adjusted, although this is quite easily done. First place the gear lever in the bottom notch, insert the push rod ("A" Fig. 1), then slip the crank lever ("B") over the end of the spindle and tap it on until the end of the lever forces the rod right home. The adjustment at "C" must, of course, first be slackened off. Tighten the lock nut ("D"), holding the crank lever on to the spindle. Next place the gear lever in neutral notch, which is between top and middle, and screw up the long milled nut ("E") until it is possible to rotate the belt rim without moving the wheel itself. This denotes the free position and consequently the correct adjustment of the gear. Finally tighten up the locking nut ("F") on the adjustment.

The gear should now be tested by placing the lever in first, second and third speeds alternatively, and watching the movement of the push rod ("A"). It is just possible that the free position has been made between first and second instead of being between top and middle. In this case it will be impossible to get into top gear. This rule is generally successful, although after a certain amount of wear has taken place trouble may be experienced with the top gear refusing to stay in, and this is usually due to wear in the pawls contained in the circular quadrant at the end of the gear lever (Fig. 14). When the gear lever is moved the disc ("D") rotates and causes the pawls to be drawn from one pair of slots to the next, the motion being transmitted to the back wheel through the crank ("C") and the gear rod. After a time the edges of these pawls become worn, and

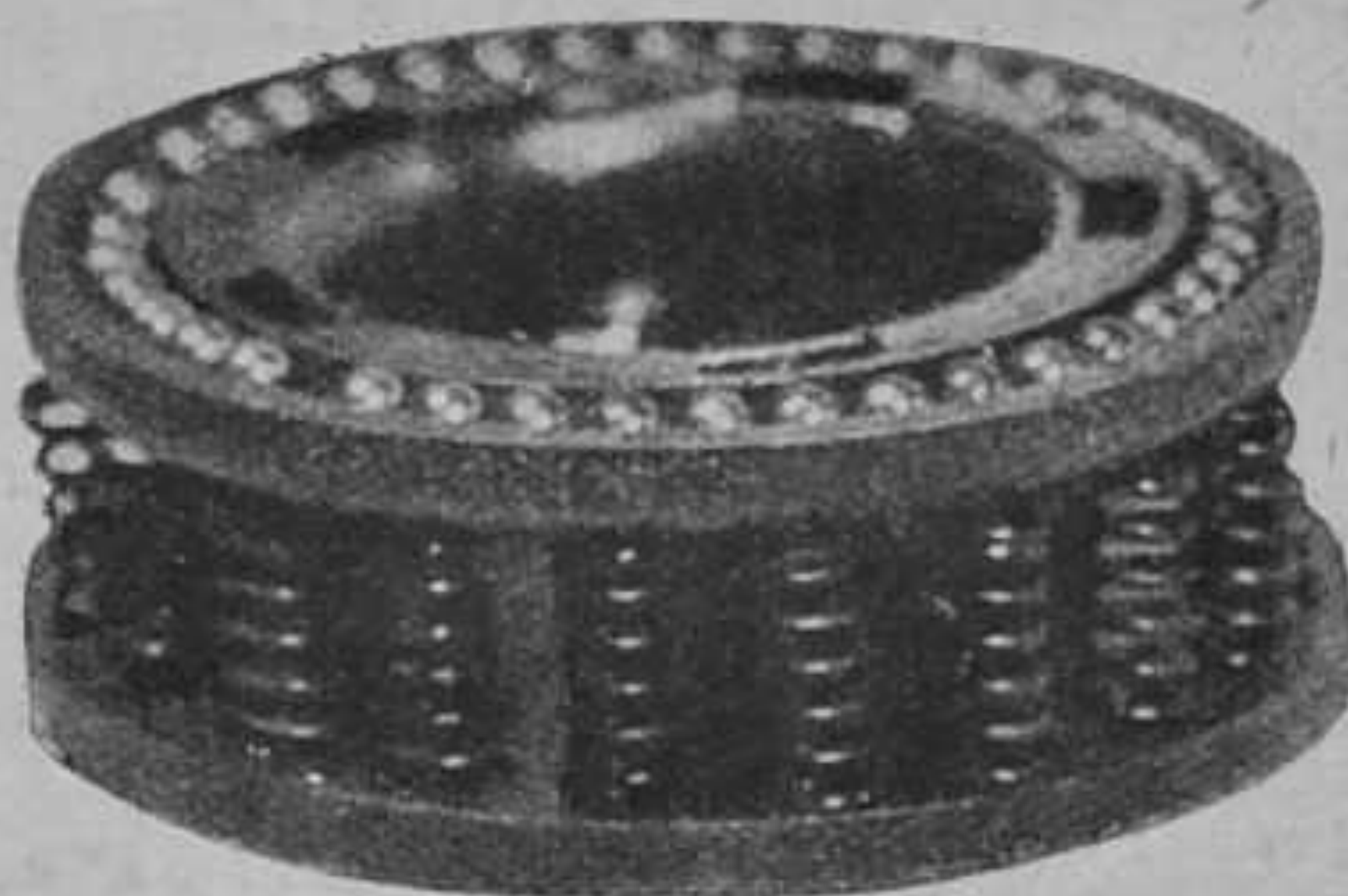


Fig. 12. - The clutch-spring retainer.

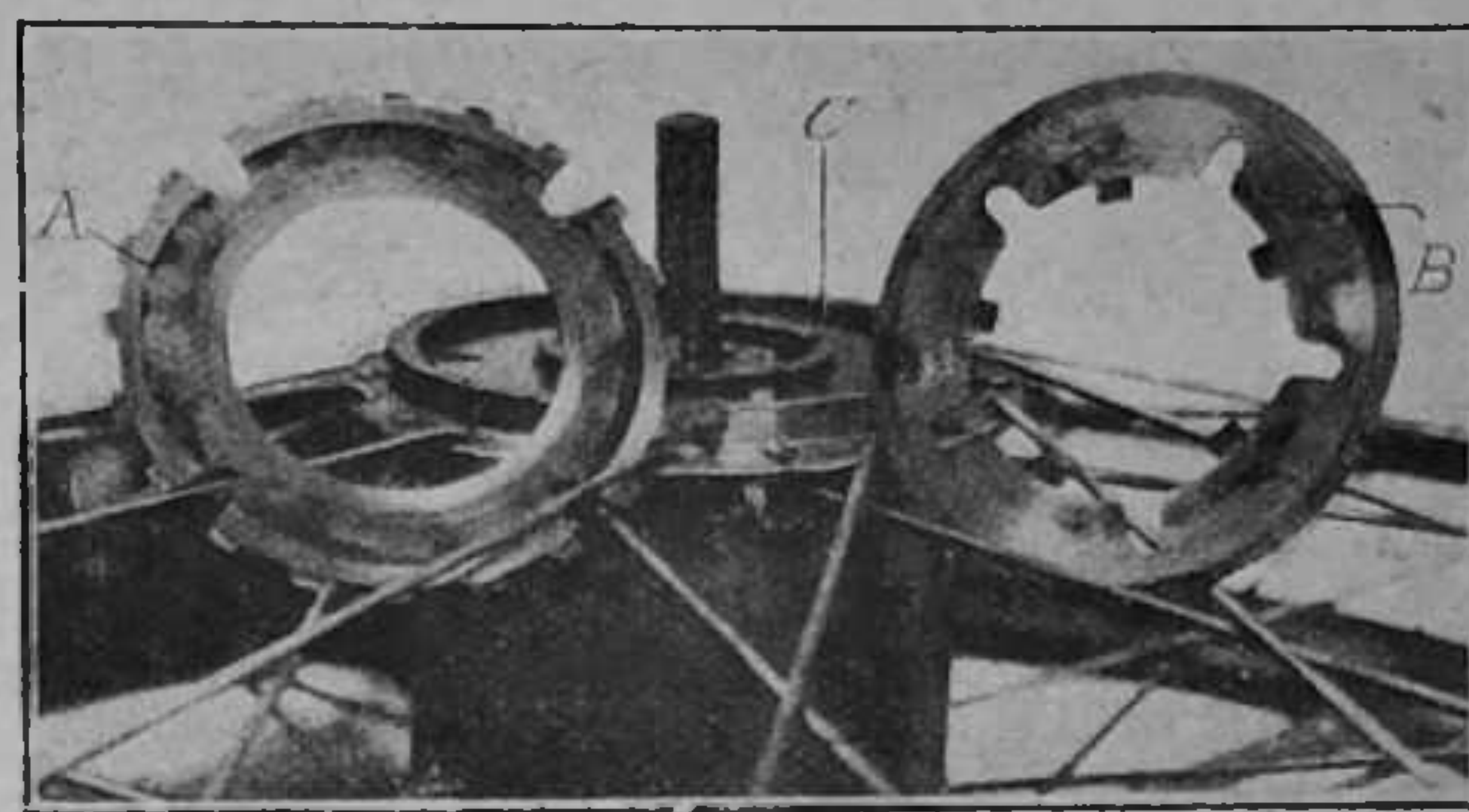


Fig. 11. - The plate removed, showing the two types of clutch plates.

occasionally the spring weakens; consequently the gears slip out of engagement. This trouble should be rectified immediately, as when this happens the gears very often slip from top gear to bottom, and this is a frequent cause of stripped planet wheels. New pawls should be fitted as soon as possible, and if these are unobtainable they may easily be made from a steel rod. They should be slightly longer than the old worn pawls, but care should be taken that they are not too long, so that it becomes necessary to force the gear lever. If any difficulty is found in replacing the pawls, an adjustable spanner placed over the end of these will soon overcome it.

### To Adjust the Clutch.

Insert the push rod, and place the clutch pedal in the "in" position; screw the cover ("A," Fig. 2) over the quick-thread until pressure is just felt on the push rod, then tighten the lock nut ("B"). Allow a very slight amount of play in the clutch pedal. Should the clutch rod refuse to remain in the "out" position, this is not so likely to be due to bad adjustment as to faulty

footrest position, and in this case the footrests should be shifted slightly so as to enable the clutch pedal to stay out when the foot is removed.

### General Hints.

Whilst the foregoing instructions will, no doubt, help those who are mechanically minded and able to carry out the majority of repairs needed on motor-cycles, it is not suggested for one moment that the absolute novice should jump to the conclusion that he could overhaul the gear after he has read this article.

The hub of which the photographs for this article were taken was fitted to a Triumph. Spare parts may be obtained from the County Cycle and Engineering Co., 64, Staines Road, Hounslow, W., and the Cromwell Engineering Co., Putney Bridge Road, S.W.

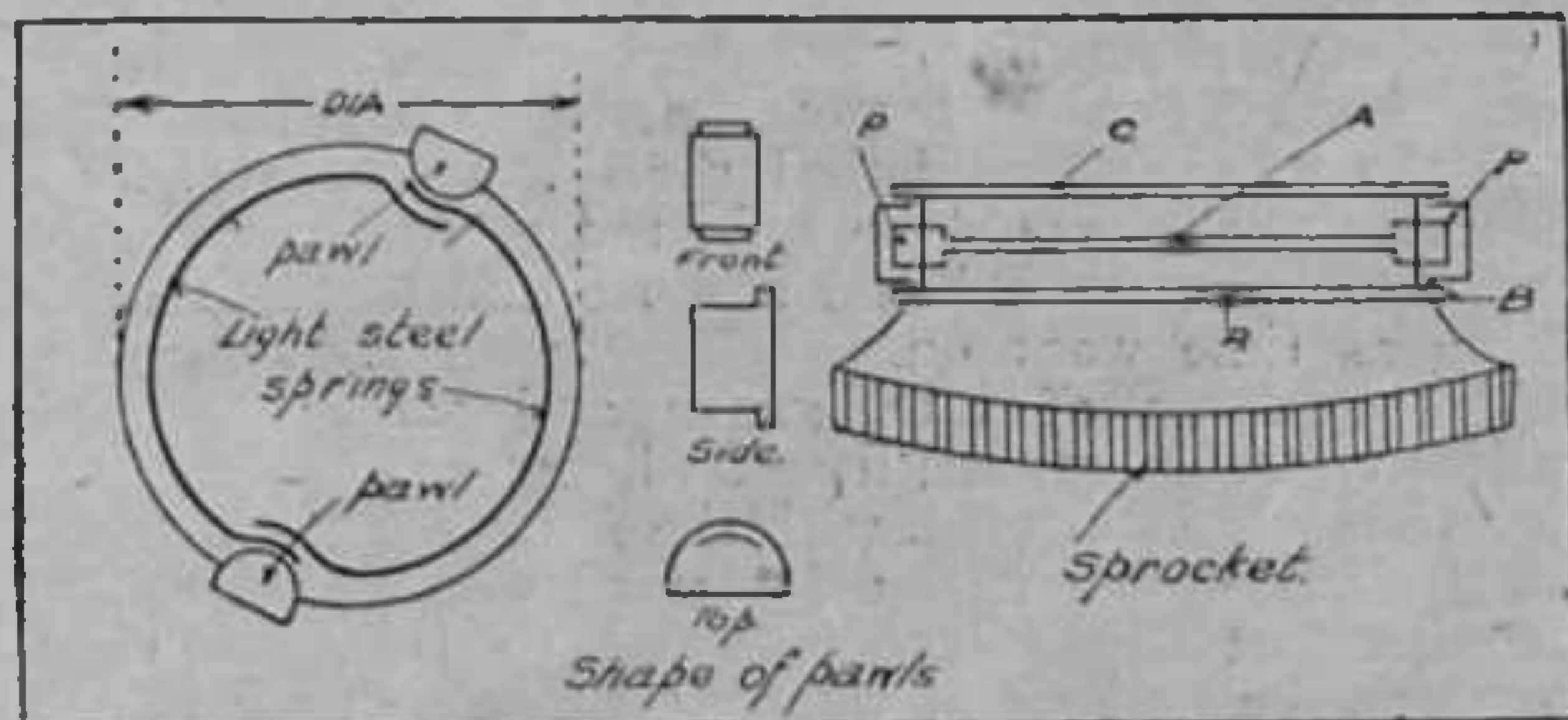


Fig. 13. - Details of the free-wheel mechanism.

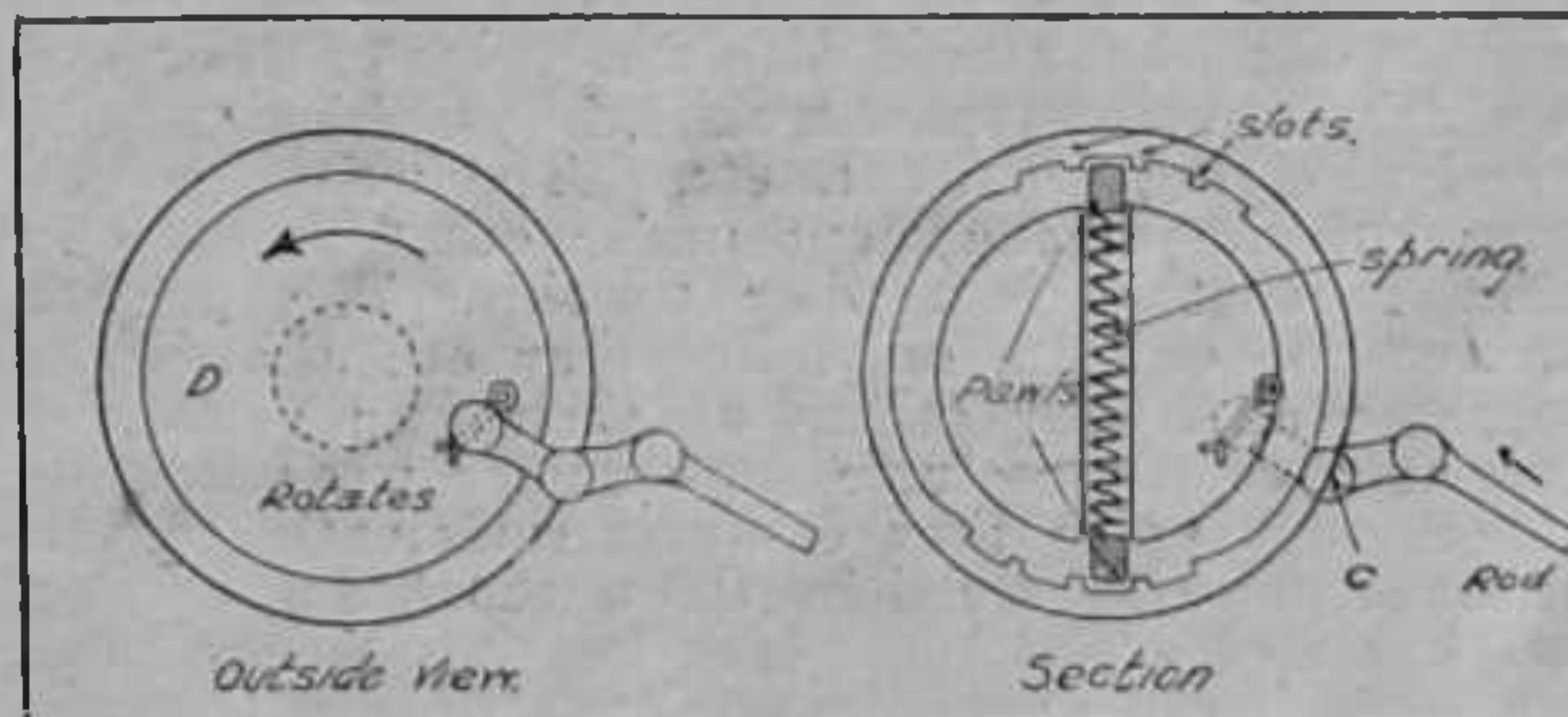


Fig. 14. - Details of the gear-changing lock mechanism.



# THE WOMEN'S

## Girls With Motor Cycling Experience Can

**L**IMELIGHT, in a war of any magnitude, is always bound to fall upon the more prominent among those who serve, as it falls to-day upon the Army and Navy, dazzling the public to a certain blindness towards the modest workers carrying forward the affairs of the nation with the same courage and enthusiasm as their more prominent contemporaries, although less conspicuously. Thus it is that although much has been written in praise of the "Woman's Army" in France, that same army at home has rather missed the share of public appreciation which it deserves.

Undoubtedly, were it not for the dislike of advertisement common to all branches of the Services, many thousands of women would be besieging the various headquarters of the "Woman's Army," begging admission to one or other of the departments in which feminine aid is accepted by the Government. The writer refers more particularly to a branch of service which could not fail to make a great appeal to lady readers of this journal, were the congenial work and conditions which it entails better known among them. This is the women's home sidecar service, promoted by the Women's Legion, many members of which are attached to various regiments and branches of the Army, including the Royal Flying Corps, the Army Service Corps, the Air Board, Red Cross, etc. The lady drivers wear the uniform of the corps with which they are serving, and detachments are to be found all over the country; a few sidecarists to each camp or headquarters, according to the strength of the corps situated there. At the Regent's Park Flying Corps Depot, where the writer personally interviewed one of the drivers, there are only three sidecars driven by ladies at present, but numbers are serving all over the country, and any lady sidecarist with a normal amount of experience cannot do better than apply to the Women's Legion at 115, Victoria Street, London, S.W. This is the headquarters of this body, and they could probably still employ a number of applicants. In addition to other work, they have already supplied sidecar drivers to the War Office.

### Life With the R.F.C. is Very Congenial, and Uniform is Supplied.

It should be understood that lady sidecar drivers serving with the different Army corps in this fashion are not in a parallel position to that of women serving in France, who are under the same military discipline as soldiers. They live at their own homes, coming to and from work each morning and evening, and are only under military discipline while on duty. During the rest of their time they are entirely free agents. On the other hand the work is not voluntary. Lady sidecar drivers attached to the Flying Corps are paid 35s. per week, and receive uniform, which consists of a khaki tunic with the badge of the corps to which they are attached, skirt, khaki shirt and tie, standard Army greatcoat, etc. The writer is not aware of the arrangement under other corps, but surmises that it is similar to this. The drivers receive one uniform only, but they are allowed to purchase and wear others of their own selection, such as a cotton costume for summer wear, for instance, so long as they conform sufficiently to the standard uniform issued by the authorities. During the period of probation, which lasts six weeks from the date when the applicant takes up her duties, recruits are allowed to wear ordinary civilian clothes.

The hours during which the lady drivers are on duty are from 8 a.m. to 6 p.m., no night work at all being required of them. For the rest of the 24 hours they are perfectly free. The duties consist mostly of delivering letters and despatches, taking messages to different headquarters, attending aeroplane crashes with a mechanic in the sidecar, etc., and, so far as the writer can gather, long runs are not often expected of drivers. A thorough knowledge of the main roads and buildings in the vicinity in which the applicant wishes to work would be advantageous, although, of course, it would be easy to pick up a certain familiarity with the district during the weeks of probation. As regards mechanical and driving experience, the requirements appear to be extremely unexact, so that no one need have hesitation in presenting herself as a recruit unless she be a complete novice. The machines supplied are P. and M.s, similar models to those used by the men, and are extremely simple machines to handle. No trial of mechanical knowledge is required, but a short driving test is imposed upon recruits, which, apparently, is very easy to pass satisfactorily. Drivers are required to know the usual amount about their machines to enable them to carry out road repairs, of course, but mechanics are kept on the spot at headquarters to attend to the machines, and carry out any serious repairs. All petrol, oil, tools, parts, etc., are supplied by the authorities.

### Meals Can be Taken at the Canteen or Outside the Camp During the Lunch Hour.

Meals, for which one-and-a-half hours per day are allowed, can be taken by recruits outside the camp, or excellent meals can be obtained at the canteen when one is provided, which is generally the case. Thus the drivers can vary their meal times, spending an hour-and-a-half over luncheon when they wish, and taking a sandwich in their pockets for tea, or vice versa.

An additional point in favour of the work is the congenial companionship which it entails. All the drivers appear to be well-educated women of good social standing, naturally enough, as nearly all of them have been private owners of motorcycles or cars, and many are doing this work out of sheer patriotism or sportsmanship. On the other hand, this work has a great advantage over voluntary service in that hundreds who would like to serve their country were it not for lack of funds can leave their posts with an easy conscience to take up these comparatively well-paid positions. Moreover, there is none of the bickering and unpleasantness so often consequent upon voluntary service: the day's work is smoothly mapped out; orders are plain, and there is no worry for the recruit at all. What is much more to any woman, at the end of the day the driver's work is over and done with and she can carry an easy conscience into any form of relaxation towards which her fancy leads her. A more healthy life can hardly be imagined, and it is the writer's belief that there are scores of lady sidecarists who would be only too pleased to obtain such work, and would find it more and more to their liking as time went on.

Most women of intelligence and some share of initiative would regard it as an honour to be brought so intimately into touch with the Army. This in itself holds a subtle fascination for many who object to the time-honoured privilege allotted to them in such crises as the present of weeping while men work.

BOADICEA.

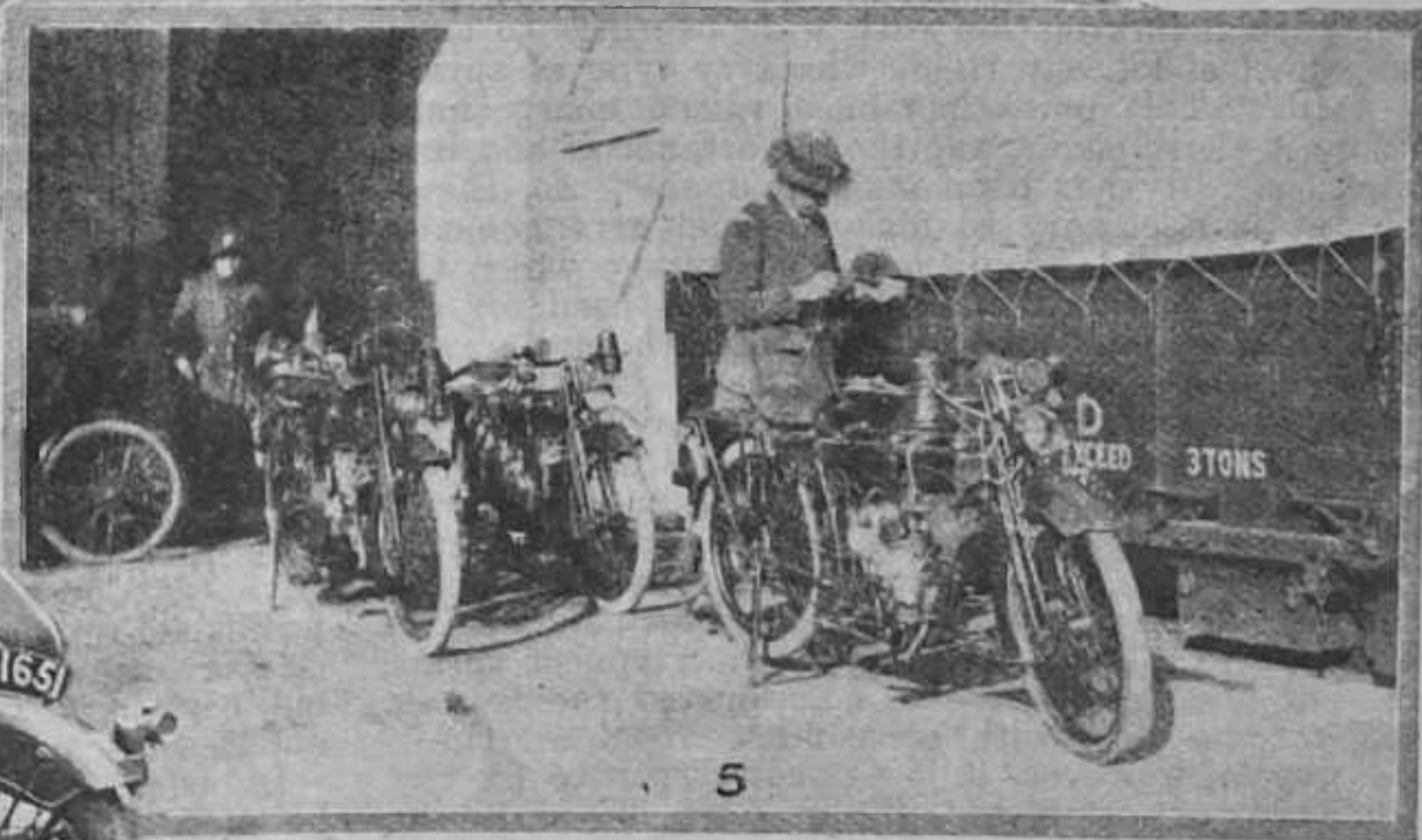
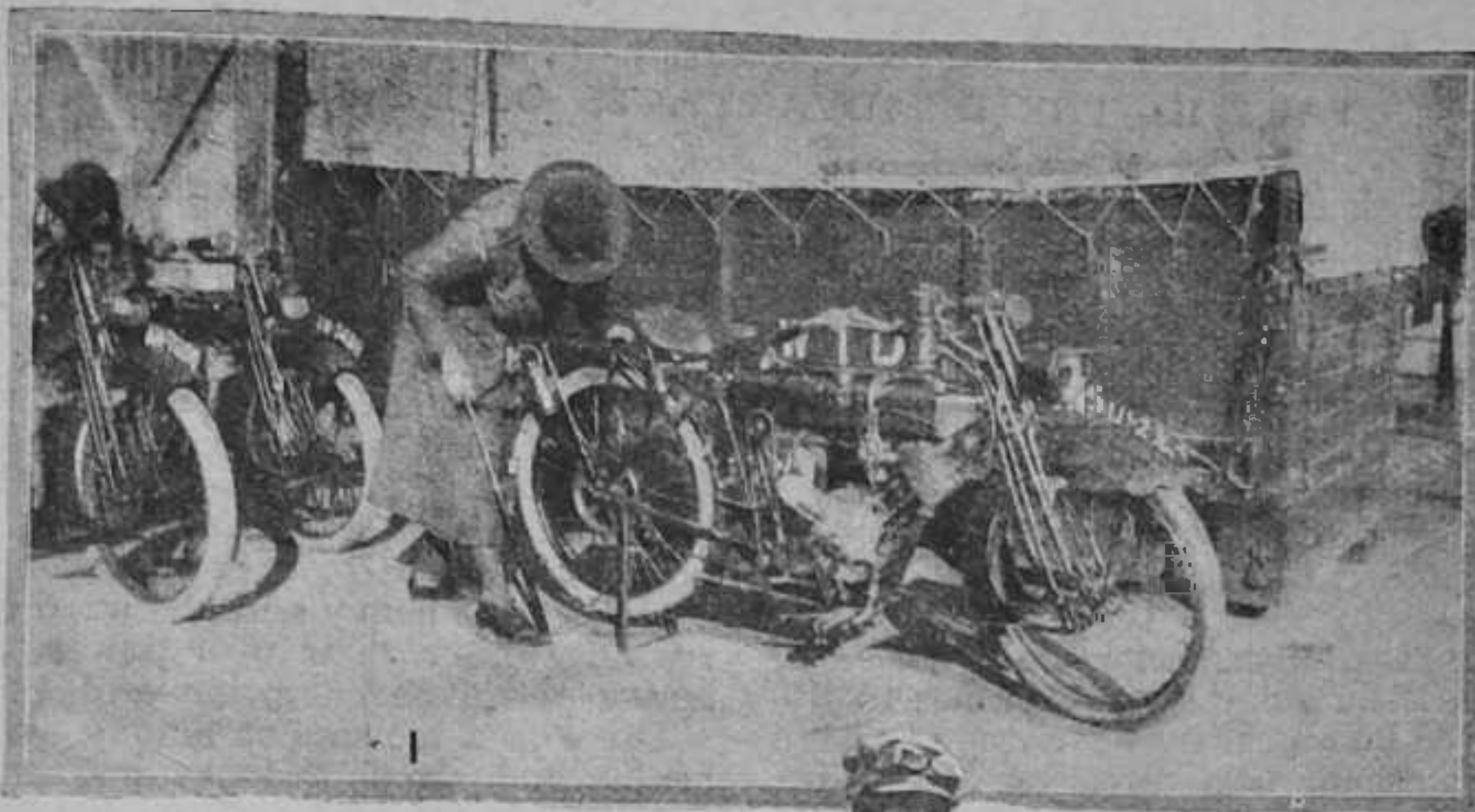


# SIDECAR SERVICE.

Fill Attractive Posts With the Army at Home.

## WOMEN WHO HAVE REPLACED MEN.

(1) Some of the lady sidecar drivers attached to the various branches of the Services. The photographs show: (1) Preparing for a long ride. A few precautions against a delay to a message. (2) Miss Kirkpatrick, the daughter of Gen. Kirkpatrick. She has organized the Women's Legion in Ireland, and is an enthusiastic Levis rider.



(3 and 4) Volunteers for the Women's Sidecar Army and their machines, which are Clynos. They are attached to the A.I.D. (5) Awaiting a call. Lady P. and M. drivers attached to the R.F.C. awaiting orders outside their garage.



# SPRINGS *and* SPRINGING.

The One Detail in Motorcycle Construction which Calls for the Greatest Improvement.

## PART II.—THE DISADVANTAGES OF LEAF SPRINGS.

**L**AMINATED, or leaf springs are universally used for the springing of motorcars, but this does not necessarily mean that they should be used for motorcycle spring frames, although many designers seem to have taken it for granted that the type of spring which works best in motorcar construction will give the finest results with a two-wheeler. This is not necessarily the case, because the conditions are very different. In a four-wheeled vehicle, such as a motorcar, it is not essential to have very great side rigidity; that is to say, it does not matter if the axles (and with them the wheels, of course) can move a little sideways in relation to the chassis. It may even be a positive advantage to have some little springiness in this direction. For instance, the type of spring used on Ford cars gives quite a considerable amount of flexibility sideways, and many engineers are of the opinion that this, to a great extent, accounts for the fact that Fords are light on tyres, apart from the question of their weight, which is, of course, very low. A certain amount of rigidity is necessary, as otherwise the car would sway about when travelling over a twisty course, and leaf springs have become universally used because they possess sufficient side stiffness in themselves to locate the axles and wheels in relation to the chassis without the necessity for providing any other special mechanism.

### Lateral Rigidity of the Rear Wheel.

In the case of a motorcycle, however, it is most essential that the rear wheel in particular should be absolutely rigid. If it could move sideways at all, or could tilt in relation to the frame, even as much as a 100th part of an inch, it would render the machine unsafe, especially on grease, and would certainly remove all feeling of safety when the rider was cornering. The leaf spring does not give sufficient stiffness for this purpose, and it is always necessary to provide special link motion with wide bearings to keep the wheel absolutely rigid, whatever type of spring is used. This point has been raised many times before in these pages, and the importance of absolute lateral rigidity has been insisted upon. As, therefore, it is necessary to make special arrangements for obtaining this rigidity, the advantage which the leaf spring has in this direction when used for car work is of no moment whatever when the motorcycle spring frame is being considered.

The leaf spring lends itself to very easy attachment, as the thick part of the spring can easily be clamped to the frame, and the main leaf can be turned over to form the eye to be connected to the moving portion in the usual way, with which all motorcyclists are familiar. This is an important point for car work, as it would be difficult to fix any other type of spring without having recourse to complicated radius rods and torque rods, with consequent expense. On a motorcycle, however, it is perfectly easy to fix any other type of spring, as is shown, for instance, by the Matchless spring frame, which uses helical springs, and is, at least, as neat as any of the spring frames using leaf springs.

For motorcycle work, the leaf spring has one very grave disadvantage, and that is its excessive weight. During the last five years or so our machines have been becoming heavier and heavier, and at the pre-

sent day it is quite a strain for a man of ordinary physique to lift a heavy countershaft gear twin, or even a big single, on to its stand. The lightest of modern countershaft gear machines is probably the War Office model Triumph, which weighs somewhere in the neighbourhood of 220 lb., whereas five or six years ago the free engine Triumph only weighed about 180 lb. Many modern machines, even single-cylinders, weigh over 260 lb. This tendency is undoubtedly a bad one, as it not only means that the machines are heavy and awkward to handle when not running under their own power, but it also means heavy petrol consumption and excessive tyre wear.

There is a movement among car designers at present, which seems to look upon weight saving as the outstanding problem in car design for the next few years. There is not the slightest doubt that this should be the case with motorcycles also. If spring frames are to become the rule, and everyone knows how badly they are needed on our present-day roads, they will inevitably mean some increase of weight over the present standard rigid frames. Surely, however, it is worth while considering what can be done to keep this increase of weight down to the smallest possible limit, consistent with satisfactory springing, and this cannot be done if leaf springs are used.

### Calculating Spring Weights.

If a spring of any particular type is taken, that is to say, the leaf spring, or helical spring, or the volute spring, it is a comparatively simple matter, knowing the loads and deflections which the spring has to take up, to calculate the mass of metal which will be required; this, of course, varies with the type of spring, and as a comparison it may be said that for the same duty a leaf spring must weigh 3.7 times as much as a helical spring made from round wire, even assuming that the leaf spring has been designed with a very large number of thin leaves so as to use the metal contained therein to the best advantage possible. This question of weight is undoubtedly a point which the advocates of leaf springs will find it hard to explain away. The volute spring, while not as light as the helical spring, is only a little heavier, and its weight will come out at approximately one-third of that of the leaf spring, designed to do the same work.

Many people are under the impression that the leaf spring has a great advantage, because of the friction between the leaves which occurs when it is working, as this friction is said to damp out the rebound and stop bouncing. This it certainly does, but it is a very open question as to whether this friction is an advantage or a disadvantage. There is very little published opinion on the subject, and it is a difficult matter to investigate theoretically or by experiment, but certain facts have been ascertained which cannot be disputed.

In order to understand whether the leaf spring will be more comfortable to ride over than the helical spring, we must first know exactly what causes the discomfort which the rider of a machine experiences when passing over a bad bump or falling into a pot-hole. Fig. 1 shows the way in which a wheel will jump when passing over an obstacle, which is, of course, exaggerated in size in this case to show the effect. If there are no springs between the wheel and



## Springs and Springing (contd.).

the rider, the rider will travel in an exactly similar path, and, in fact, the effect will be much worse, because the total weight concerned will be greater. It will be noticed that upon hitting the obstacle the wheel moves upwards. Now, it is not this upward motion itself by which discomfort is caused, but the fact that the upward motion occurs quite suddenly,

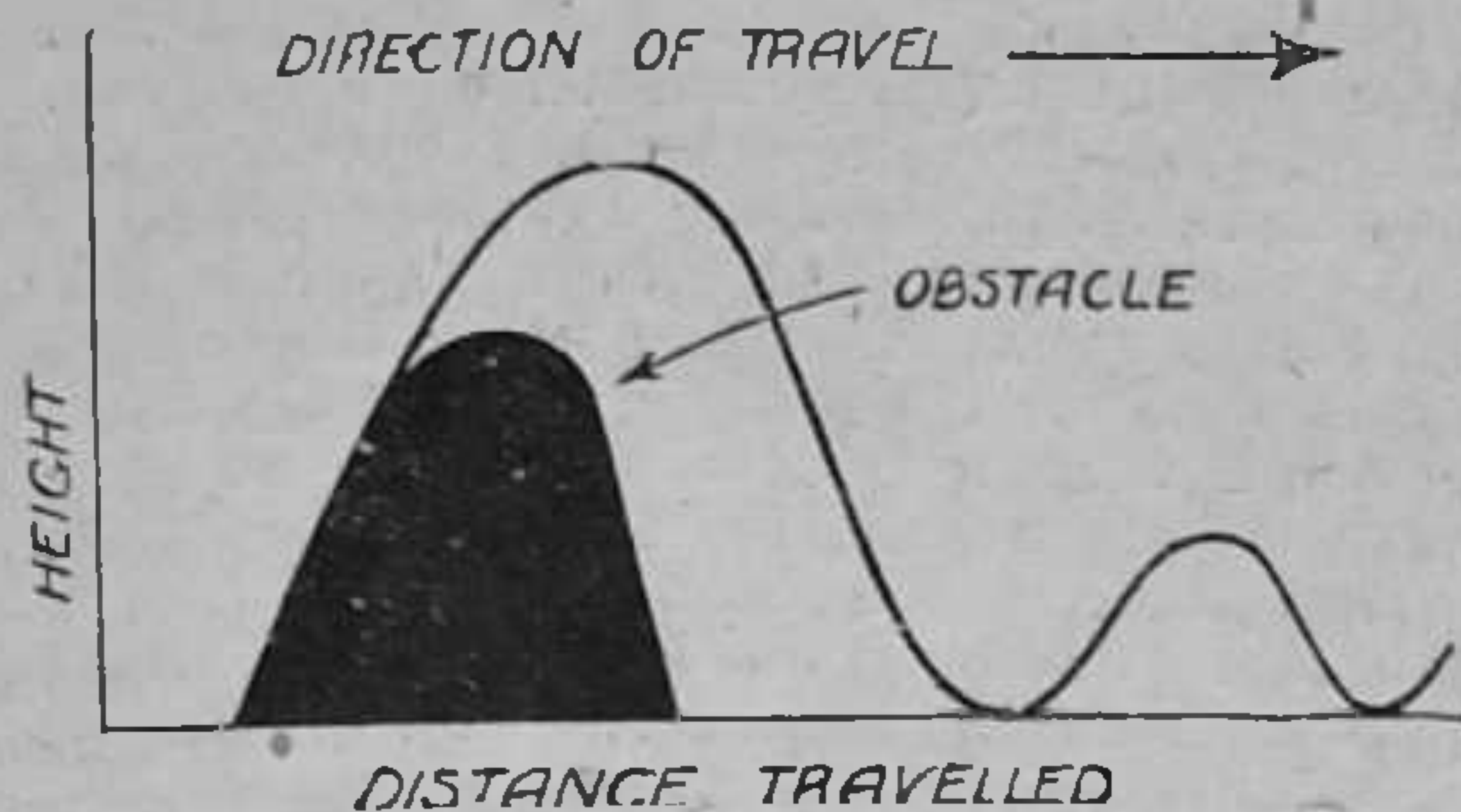


Fig. 1.

whereas previously the rider and the machine were travelling along quite a level path. Without going into technicalities, it is sufficient to say that the measure of discomfort is the rate of change of acceleration at any particular time. Actual acceleration, even in a vertical direction, is not uncomfortable, as will be seen from the action of an ordinary lift, where the acceleration is approximately constant, or in the case of an electric train starting from rest.

## The Rule of Change of Acceleration.

When the train or the lift is stationary, there is no acceleration; after it has moved a few yards the acceleration becomes very high, that is to say, over this period the rate of change of acceleration is great, and corresponding discomfort is experienced. As soon as the train or the lift has covered a few yards, the acceleration becomes constant, and the uncomfortable feeling immediately disappears. What is needed, therefore, if comfortable riding is to be ensured, is to prevent the rate of change of acceleration from becoming any larger than the absolute minimum which can be arranged for. Of course, a lot will depend upon the size and shape of the obstacles with which the wheel meets, but, as has been shown previously, volute springs can be designed so as to be suitable for both light and heavy shocks.

Having decided that it is rate of change of acceleration that causes discomfort, the action of the friction between the leaves of an ordinary leaf spring can be considered. Fig. 2 shows what happens when the wheel of a motorcycle provided with a spring frame meets an obstacle, the lower curve (A) showing the motion of the wheel, and the other curve (B) the motion of the frame to the same scale. It will be noticed that, as would be expected, the motion of the frame is much more gradual than that of the wheel, the latter being forced back on to the road quickly by the springs. Now, while the wheel is still rising, and the frame is rising also, but more slowly, the friction between the leaves of the spring will be tending

to push the frame upwards. When a certain point is reached, however, the wheel begins to descend again, and at that moment the distance between the frame and the wheel begins to increase. Therefore, the friction between the leaves of the springs is now tending to pull the frame downwards again, whereas while the wheel was still rising it was tending to push the frame upwards. At the moment when the wheel is at the top of its path, therefore, the friction suddenly changes from an upwards to a downwards force, with a consequent sudden change in the acceleration on the frame, or, in other words, with a very high rate of change of acceleration.

## The Leaf Spring Fallacy.

There is no doubt whatever that the friction between the leaves of the spring causes a bad jerk at this point, and that a spring without any friction at all is much more comfortable. Those who do not care to follow the theoretical side of the matter have only to remember that it is the practice on cars to insert grease between the leaves of the springs in order to minimize the friction which does take place; in fact, special tools are sold to enable the leaves to be forced apart while grease is being inserted, and the latest thing on the market is an arrangement of leather gaiters, by means of which the springs are kept in a bath of grease continually. Surely, if the friction were useful in damping out the rebound, every effort would be made to increase it, and not to decrease it as much as possible, as is at present the case. Yet people will still say that, owing to the friction in a leaf spring, it is much more comfortable than an ordinary helical spring, or, in fact, than any other type.

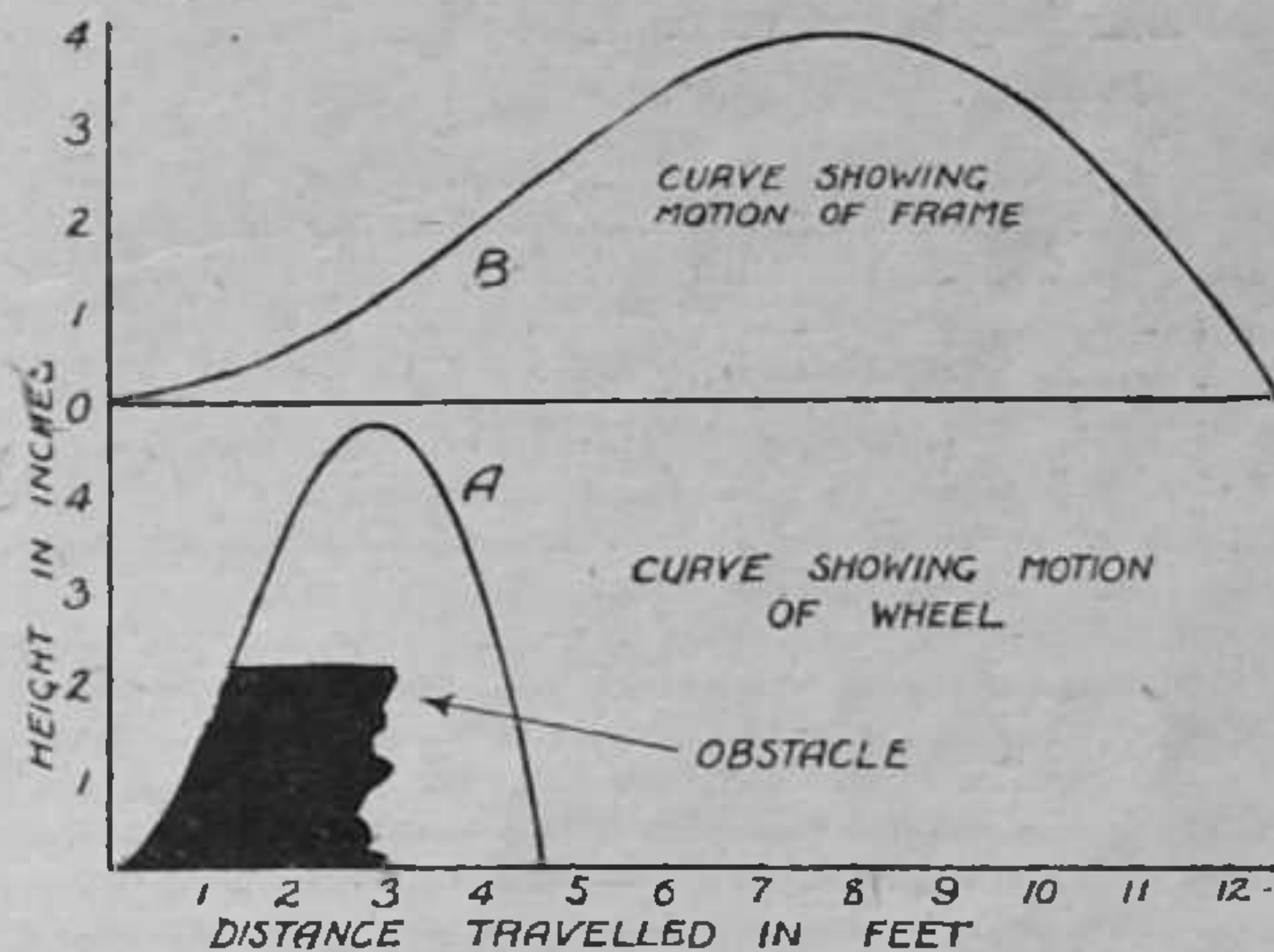


Fig. 2.

For all practical purposes it would seem that the volute spring is the most satisfactory type, although it is at present unknown in the motorcycle world. If for some reason volute springs are rejected, the next type of spring, in order of merit, is the helical spring, preferably with some compounding arrangement to stiffen it up under heavy loads, such as in the case of the Brooks saddle.

A Demonstration of all types of vehicles converted to run on coal-gas will be held on Wednesday, 10th October, at 2.30 p.m., at the Commercial Vehicle Repair Depot and Garage of Messrs. John I. Thornycroft and Co., Ltd., Pulford Street, Grosvenor Road, S.W. Cards of invitation can be obtained from "The Commercial Motor" Gas Demonstration Department, 7-15, Rosebery Avenue, London, E.C. 1.



## CROSS-COUNTRY COMMENTS.

## Why Did a Mag-lighting Outfit Fail?

SINCE losing the extra hour of summer time—which, by the way, was in my opinion repealed about a month too early—I have been compelled to trim my lamps before leaving business. When petrol flowed free, the journey to and fro was made by car, sidecar or solo motorcycle, according to the weather and my fancy, but the existing conditions demand the use of the latter almost exclusively, and unless coal-gas or some new fuel comes to the rescue, I must continue to use it throughout the winter. On both car and sidecar are installed modern dynamo lighting sets, and with a spare set of accumulators for each I have received wonderful service. I can hardly remember the last occasion on which I was caused the least trouble with lights on these two outfits. This success I attribute in no small measure to the reserve sets of accumulators, which permit one set being constantly charged on the switchboard at home while the other is in use. When the accumulator has been severely taxed overnight by the outfit standing with lights on for several hours, it is replaced the next morning by a fully-charged cell. This practice also keeps the plates in good condition. I have by me now an accumulator that has seen four years' service, and the plates seem perfect even today. I have another sidecar that carries a dynamoless installation, and which has given me equal satisfaction, due unmistakably to the constant charging and changing of the cells.

HAVING thus tasted the sweets of electrified machines, reverting to the old scheme of acetylene for the headlamp of my solo machine held little attraction. It will be remembered that, some months ago, I gave an account of the working of a little Mag rear light on this same machine, and the service and behaviour of this over such a

A Mag-lighting Set. long period induced me to buy a combined head and tail lamp set of a similar type, which relied for its supply of current on the low-tension winding of the magneto. The fitting of this set entailed about two hours work. The task was more or less a labour of love, for the unpacking of the set and the viewing of it in all its workshop glory fired me with enthusiasm. The little headlamp and its bracket had a neat appearance and appealed to me greatly, while it would be difficult to obtain a better-shaped or more efficient lamp for these times. I was gratified to find, on switching the light on after starting up the engine, that both bulbs glowed. I might have added, a dry cell was in circuit for use when standing. With this set on the machine, I felt happy, and rather looked forward to the coming darkness. The time, however, soon came for the homeward journey, and it was with a light heart that I took the machine from its little garage and prepared to get away without delay. I flooded the carburetter and jerked the kick starter as usual, expecting an immediate response, and was just a little annoyed to find the engine did not start on first kick, as was invariably its habit. I again used the starter, this time a little more energetically, but was surprised to find that nothing happened. I tried a third and a fourth time, again flooding the carburetter between each effort, but it was fruitless. I then set about tracing the trouble by examining and cleaning the plugs, testing the tappet clearances and finally cleaning the carburetter thoroughly, but still the obstinacy remained. I was growing rather impatient, and was about to give up the task, when I removed the magneto cover to examine the breaking of the points.

In doing so, I had to remove the wire that tapped the low-tension current for lighting the lamps, and by some intuition I gave the starter a kick while the cover remained off the magneto, when, behold, the little engine immediately buzzed away merrily. Of course, I took the clue at once, and alternately connected and disconnected the lighting system, when I found, to my dismay, that with the lights switched on and the battery off, the engine flatly refused to emit a single explosion. On switching off the lights, the engine would start without the least effort. I tried revving the engine and switching on the lamps, but even though the engine continued to turn over at high speeds there was only the barest sign of redness in the bulbs. This disgusted me, so I disconnected the wires and utilized the batteries to get home with. Up to now I am not quite convinced whether to blame the magneto or the lighting system, but I am positive the wiring of the lamps is correct, and I also know that previously to this the magneto gave me no trouble at all. There is evidently something amiss.

THE Association of British and Allied Manufacturers is progressing apace, and it is very gratifying to see the manufacturers supporting it so enthusiastically. The little figures of Britannia at the foot of many advertisements that one cannot help noticing these days are the straws which

A show the way of the wind, and incidentally tell also that the manufacturers are determined to wage a commercial war not less in magnitude than the present cataclysm. Unity and the welfare of the industry have taken the place of the old spirit of antagonism which was rampant—although few would admit it—amongst the manufacturers of a few years past. In the cycle boom of bygone days this feeling was most pronounced; in fact, manufacturers ignored their competitors, scorned the ground they trod and hated their success. The older hands of the city of the Three Spires well remember and understand the period and feeling to which I refer, and the Cycle and Motor Cycle Manufacturers and Traders' Union must be given the credit for relieving the situation. Unfortunately, the energy of this body had to be devoted in other directions, and the seed sown in the good groundwork never fully matured. In fact, with the events of this war before one, it is difficult to see how this trade union could pursue such a policy with any vigour, as its members must have interests other than British, and, therefore, there could not be the harmony that a strictly British union could command. It is just this gap that the new association has filled: its founding has sounded the death-knell of the old antagonism, and being entirely British, it has but the axe of the British manufacturers to grind. That it is succeeding, there is little doubt, and that goodwill has replaced ill-feeling has been convincingly displayed in a recent advertisement of the Standard Motor Co., in which prominence was given to the names of no fewer than 60 competitors. COOFE.

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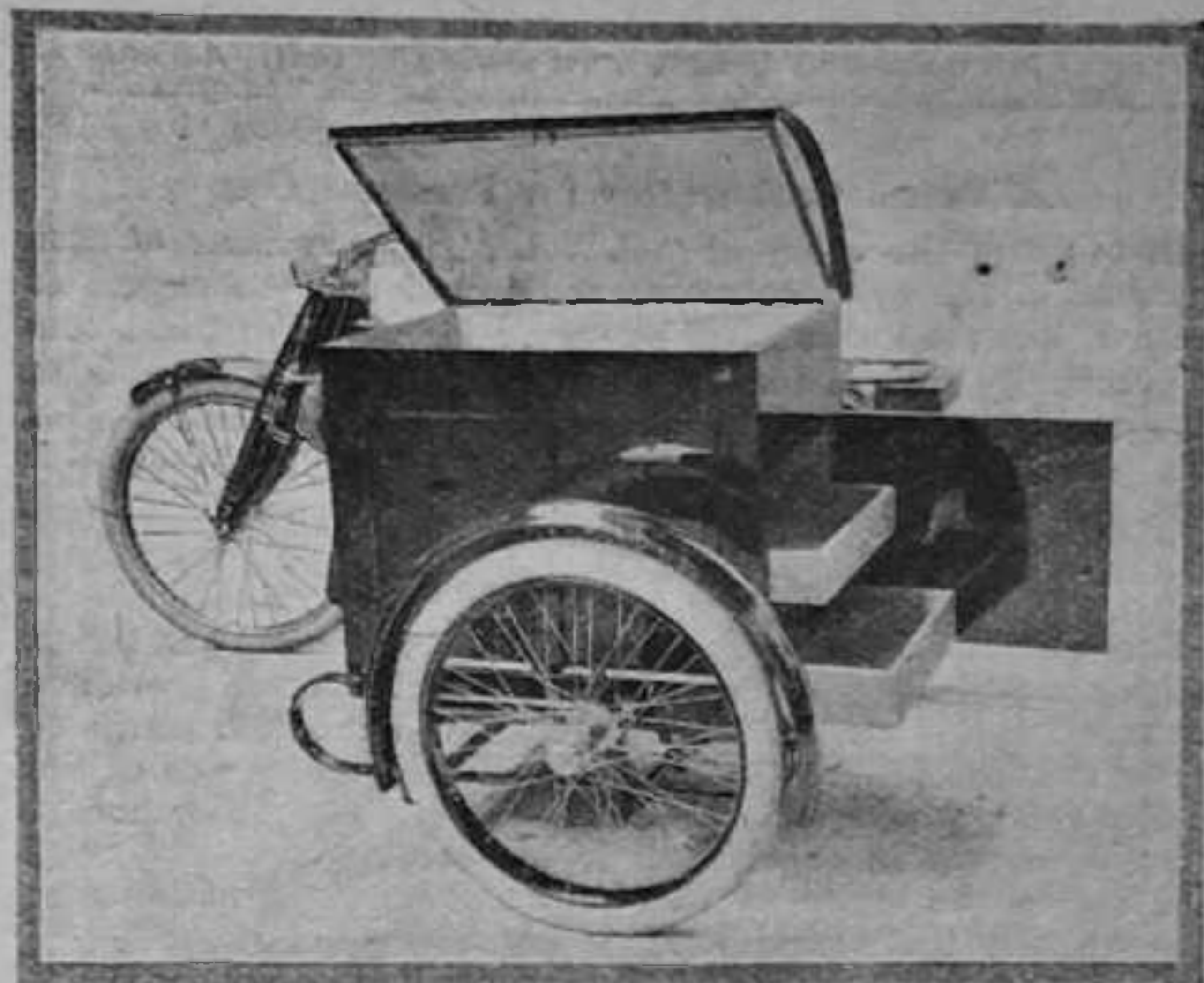
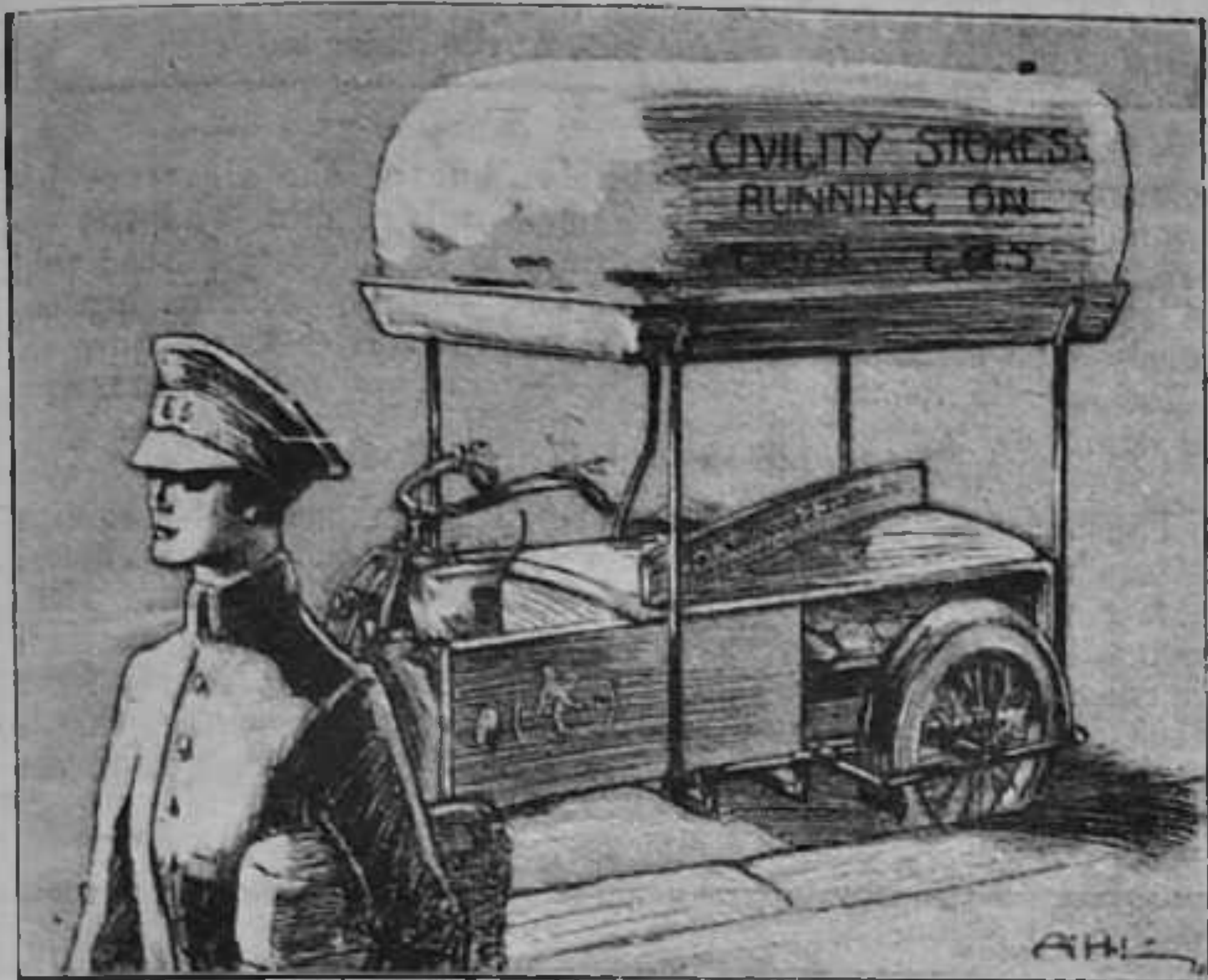
#### Looping with a Motorcycle.

An American cyclist, who thrills thousands by looping the loop on an ordinary cycle, decided to make the show more sensational by using a motorcycle. It is interesting, however, to learn that, although the engine is kept running at a high speed with a consequent crackle from the exhaust, there is no connection between the engine and the back wheel. The momentum gained from the rush down the steep incline being sufficient in itself for the purpose of looping.



# The Motorcycle and Sidecar as a Trade Vehicle.

## Some Suggestions for Its Development.



A gas-bag fitted to a trade sidecar would attract a great deal of attention, save petrol and cheapen running costs. Of course, the possibilities of advertising on the bag would not be lost sight of. The sketch also illustrates some of the writer's suggestions. The photograph shows a trade sidecar designed particularly for a baker and confectioner—hence the trays.

WITH petrol, lubricating oil, tyres and other accessories still rising in price, many tradesmen and others who formerly used large cars or vans will begin to consider which type of vehicle will combine economy with efficiency. The motorcycle and sidecar has long been used by shopkeepers for the delivery of their goods, and there are signs that the commercial traveller is beginning to realize its value, not only as a means of getting about the country, but also as a convenient way of carrying his samples.

Those who have used the motorcycle for the delivery of their goods in the past have either had a large basket fastened on at the back (only useful for small articles, however), or they have attached an ordinary sidecar and piled their goods in that, usually in baskets. This latter method is not always convenient, and at its best can only be regarded as a make-shift.

### The Design of Special Bodies.

If the motorcycle and sidecar as a commercial vehicle is to gain that popularity which it undoubtedly deserves, it must be developed on the right lines to appeal to the tradesman as a machine which can carry a fair quantity of goods on each round of delivery. To do this properly a special sidecar is necessary, and it is to be hoped that makers will in the future turn their attention to the design of a sidecar body which will be really suitable for trade purposes. Various designs would be required, for a body suitable for a greengrocer or a butcher would certainly not meet the requirements of, say, a confectioner. Some would desire a covered-in body with shelves; others an open one without shelves, and so on. Also, if the class of goods to be carried were borne in mind when designing the sidecar, the maximum carrying capacity would be assured, together with the utmost saving of space.

Another important matter would be to provide the means of getting out one basket or parcel without disturbing all the rest, or at any rate a good proportion of them. This might not always be possible, but a little care and thought would enable this difficulty to

be overcome to a great extent. For instance, a large door at the side would make shelves easy of access. Should the wheel, however, make it impossible to have a door large enough to get conveniently to every corner of the interior, then the whole side of the body might be made to slide sideways or upwards, in the latter case bending over the top of the car but not coming right out, after the manner of the book form of photographic plate-holder.

### A Gas-driven Trade Sidecar.

An attractive side to this suggestion of using the motorcycle and sidecar for trade purposes, apart from its economy in petrol, is its adaptability to coal-gas. True, its gas bag would be smaller than that carried by a large car, but it should go considerably further without refilling than the larger vehicle on account of its proportionately smaller consumption. Sidecar makers would do well to bear in mind the matter of carrying coal-gas when designing a sidecar for commercial purposes, as it is beyond doubt that many owners will want to use it instead of petrol.

As an economical machine, for the quick delivery of goods in fair quantities, the motorcycle with a suitable sidecar has a great future before it. Those who must have something bigger, however, would do well to consider the light car—an excellent intermediate vehicle between the proposition under consideration and the large van. But where running costs are the chief concern, together with low initial outlay and small garage accommodation, the motorcycle and sidecar will probably be found the cheapest and most convenient means of delivery extant.

ROVERITE.

[Our contributor makes a suggestion for the use of gas on commercial sidecars, and we are certain that concerns, who are at present utilizing sidecars for the express delivery of small goods, will be very well advised to consider the suggestion carefully. We have found from our own experiences that the use of coal-gas means a saving of one penny a mile on our running expenses, and this is an item certainly worth considering.—ED. MOTOR CYCLING.]



# THE EDITOR'S CORRESPONDENCE.

The Editor is not responsible for, neither does he necessarily agree with, the views taken by correspondents. Both sides of any topic are given equal publicity. A pen-name or initials can be given for publication, but the writer's full name and address must always be sent. All communications should be written on one side of the paper only.

## A Petrol Carburettor for Pressure Gas.

In reply to the query of "R.W.L.," in your issue of 25th September, the cylinder mentioned would run the engine as desired, but the carburettor as suited for petrol or petroleum is practically useless for pressure gas. I hope to be able to give at an early date the alterations to my B. and B. for this purpose.

F. WILSON.

34, Austin Street, Wolverhampton.

## Coal-gas Carburation.

Surely "L.J.," in your issue of the 2nd inst., has fallen into error when he comments upon the piston valve controller described by "F.J." in *MOTOR CYCLING* of the 25th ult., and states that the force of the explosion on the under side of the piston valve would open the inlet valve. The difference in area as shown in the sketch is at least double, to the credit of the inlet valve, and actually this would work as an automatic valve without fear of the explosion opening the inlet valve. The idea is excellent, but a mechanical mind will realize that difficulty will arise in keeping the piston valve tight and in getting the whole lot permanently into line without undue wear.

P.G.

Wimbledon.

In reply to "L.J.," who writes in your issue of the 2nd October criticising my piston valve controller for admitting coal-gas to the engine by means of the lift given to the inlet valve, would not the pressure upon the head of the inlet valve be sufficient to counteract the slight pressure which would be exerted by the explosion upon the bottom of the head of the piston valve? Surely, as the diameter of the inlet valve is so much greater than that of the piston on the gas controller, this would be inevitable?

With regard to the shape of the gas port, this could best be found by experiment; unfortunately, however, I have no workshop down here or I should most certainly experiment in this direction and let you know what size ports, etc., give most satisfactory results. Of course, as stated by "L.J.," a sleeve could be used in the same manner, and if graphite were introduced in between the sleeve and the cylinder occasionally, I can see no reason why it should not give every satisfaction.

F.J.

Gloucester.

## How to Remove Petrol Stains.

Can any of your correspondents who have had experience of Petrol advise me how to remove the stains on the tank made by this substitute? When quite full, the tank leaks on rough roads at the filler cap. Some Petrol which spread over the tank in this manner was allowed to dry, and I cannot remove it now by any means. I have tried rubbing it hard with a rag soaked in petrol, but this only brings the enamel off the tank. The brown, unsightly mess has a very deteriorating effect upon the appearance of the machine.

Manchester.

SUBSTITUTE.

## The Expansion of an Aero Engine.

I am much interested in the correspondence in your columns on aero engines. May I point out to "1st A/M, R.F.C.," that the application of a coating of dull black to the cylinders could not, by all the fundamental laws of radiation in physics, tend towards heat. However, of course, as "G.B.A." says, at great altitudes over-efficient radiation would be a disadvantage.

Further, with regard to the possibility of engine seizure, under the conditions stated by "1st A/M, R.F.C.," such

seizure does indeed seem unlikely, but as the clearance between cylinder walls and pistons is only 1 mm. and the coefficient of expansion of aluminium is .000023, whereas that of steel is only .000013, when the engine becomes heated, surely such seizure is possible, if improbable.

Rossall.

ROSSALLIAN.

## Motorbuses and Horse Fodder.

The standard bread and sweet-pea Press are still receiving letters about "joy riders" and their evil doings. I enclose a few photographs taken one Sunday at Lambourne End, Hainault Forest. The buses are full in the morning on their journey to Lambourne End, returning practically empty for a fresh load, and vice versa in the evening. Of course, this is not joy riding, but it represents a pretty low average on the m.p.g. per passenger.

JOY  
RIDES!



Essex joy-riders. The motorbus uses petrol, the horse eats oats. Note the motorbus returning nearly empty to pick up a fresh load of pleasure-seekers. See letter from "Ilfordonian."

Incidentally, I wonder if the horse vehicles one sees all over the place on Sunday pay the Inland Revenue tax? Or are they all taking people to church, thereby avoiding the duty? A motor does not eat the nation's food when not in use. Horse fodder will feed bullocks, which form an important part of the nation's food. It appears as if those who denounce motoring are incapable of seeing more than one fact at once.

Ilford.

ILFORDIAN.

## Multiple Electrode Plugs.

With regard to the use of plugs with multiple electrodes, your correspondent states that electric current invariably follows the least line of resistance. This is quite true, but very often a magneto generates more current than can pass through one electrode. When a plug is fitted with more than one point, the others will relieve it and the spark will take place at two or more points. This can easily be proved if a two or four-cylinder engine is used for demonstration, and one of the plugs is removed, placed on the top of the cylinder, and the engine is started. There should be no trouble in setting three or more plug points at an equal distance if a proper gauge be used. Personally, I prefer a plug with one electrode, making the plug gap a little wider if the magneto generates a strong current, as unless this is done, or the magneto is fitted with a safety gap, the current is liable to short circuit inside the plug.

D. B. FOUBISTER (Lieut.).

West Sanding, Kent.



## Correspondence (contd.).

## Accessibility.

In your issue of 2nd October "Cooee" relates an experience of a friend of his with a 7.9 h.p. American outfit, which required the removal of the battery case before he could tighten the gearbox fixing nuts. In common fairness, I should like to point out that this is entirely unnecessary in the case of the Indian machine, which is supplied with special spanners for this adjustment in the standard tool kit.

I have covered over 10,000 miles on my present model, which is my ninth of this make, and should never dream of riding any machine without a spring frame now. Usual disclaimer. Catterick.

R.N.

## Wheel Support on One Side Only.

I was very much interested in your article entitled "Improving the Breed" for the 18th ult., in which your contributor states that the motorcycle wheel which is supported upon one side is much more satisfactory than that supported



A lady munitioneer takes the see-saw in the obstacle race at a Midland munitions sports meeting held recently.

in the usual manner. I used to own one of the early model James machines, with the wheels supported upon one side only, and I found it a great improvement upon the ordinary pattern of motorcycle frame. For repairing punctures, cleaning, removing wheels, etc., it was ideal, and I cannot understand why the machine was not more popular.

I notice that your contributor does not refer to the springing of the front wheel, and as this was one of the strong points of the James frame, I think it is worth mentioning. The front wheel was sprung upon leaf springs, about 6 ins. or 7 ins. long, and the steering was after the same pattern as that of a car. It was impossible for any pot-holes to affect the front wheel, and this arrangement gave every satisfaction.

E.F.C.

B.E.F.

## Part-time Work for Women Volunteers.

I noted with great interest your paragraph last week dealing with the opportunity of national service offered to lady motorcyclists by the Women's Legion. For some time past I have been eager to put my motor-cycling experience at the disposal of this body, but upon applying some months ago I was told that no part-time workers could be accepted for posts. As a married woman with children to look after it is impossible for me to absent myself from my home for the whole day, but surely a relay service of workers situated in the same position as myself could be arranged, and would work successfully? There must be numbers of women who would gladly give up their mornings or their afternoons to the Legion, and I should imagine that a large staff of part-time drivers could be arranged so as to give better results than a scanty and over-worked one of full-day workers. Un-

employed women with all their time at their disposal are hard to obtain nowadays, however tempting the work for which they may be needed, and it seems a pity that the Legion does not realize that the best course is to take what it can get in the way of recruits and be thankful.

SOLUSETTE.

Kingston.

## How to Remain a D.R.

I have read with interest the article by "R.E." which appeared in your issue of the 25th September, concerning the present-day method of training despatch riders for the British Army. Perhaps the author will favour the military section of your readers with a further article upon "How to Remain a D.R." after having "passed out" of the training course which he so glowingly describes. His statement that if the D.R. passes his final examination he is entitled to rank himself as sapper, and his pay is increased to 2s. 3d. per day, would appear to be misleading. Many of my comrades who passed that final examination and are now simply awaiting draft, are still pioneers, drawing 1s. 8d. per day. Perhaps they will not reach the happy state mentioned by your correspondent until they have left England. Moreover, the fact that the motorcyclist has "passed out" is no guarantee at all that he will be used as a despatch rider. Quite a large number of men in this position has recently been transferred to other branches of the Service, so that all the valuable training they received, likewise the petrol they used, has apparently been wasted. Let it not be thought that the motorcyclists so transferred are inefficient. Well-known trade riders, also middle-aged men with 10 and 12 years experience in the trade, are among them. These men are naturally hard hit by the new circumstances in which they find themselves, and are wondering why they were ever led by the powers that be to believe that they were destined to carry despatches on beautiful War Department models.

Some of your readers may protest that these men are conscripts and cannot, as such, expect the same treatment as the old volunteer D.R.s. Certainly, some are conscripts, but a great many are old Territorials and men who have done their bit at the Front in fighting units in the old days when the Army did not trouble what a man's trade was. When men of skilled trades were informed that they could transfer to branches of the Service where they would be of more use, they applied.

passed the trade test and ultimately found themselves passed out as efficient pioneer D.R.s. They then experienced the pleasant sensation of hearing their names called out for draft to other branches of the R.E.s. I do not presume to criticise: my object is merely to state a few facts which may interest your readers, and I hope I am not contravening the regulations of D.O.R.A. in so doing.

PIONEER.

## A Douglas-Levis.

I beg to congratulate the Anzac who fitted up the Douglas-Levis illustrated in your issue of the 2nd October. Given T.T. or semi-T.T. bars and a spark control, it would be ideal as a mount, and ought to be producible at a low selling price. A better front mudguard and footboards could be provided, and the engine could easily be fitted into a frame so as to give a splendid road clearance with low saddle position.

"Jehness" complains that a motorcycle cannot be pulled up in its own length. I would say that neither can a car if it be exceeding 10 m.p.h. without ruinous effect upon the tyres, and any motorcycle can be stopped by shutting its throttle right off with a jerk. In fact, I have made it a rule to do this, and I have not found that any damage resulted.

14, Scotland Street, Edinburgh.

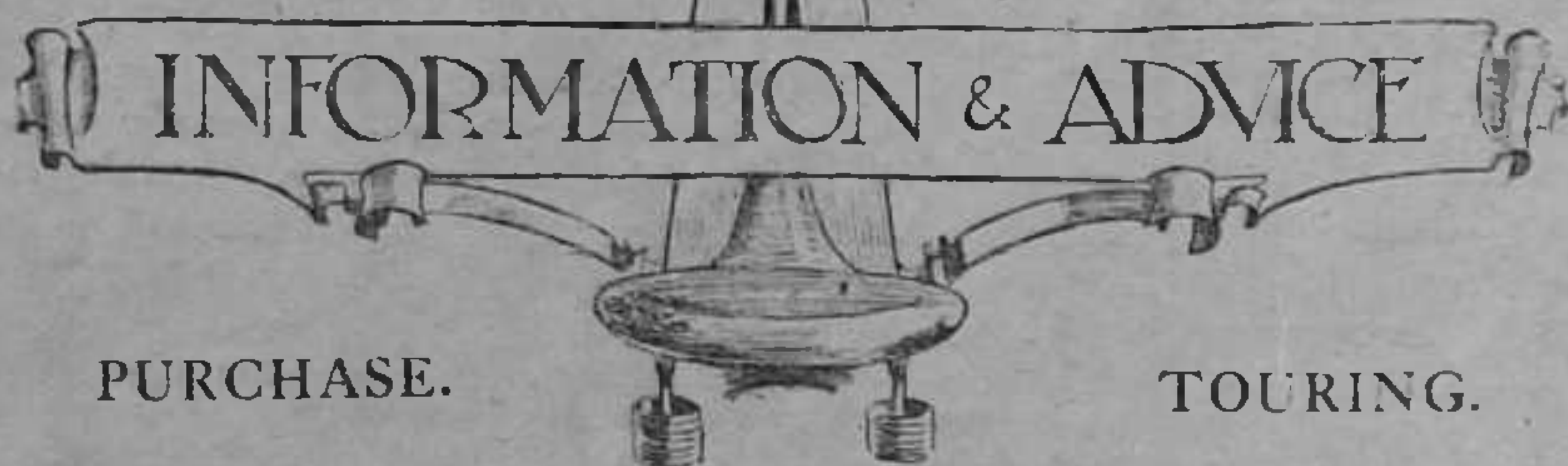
FRED WILSON.

The Editor is always pleased to receive letters for publication. It is essential, however, that they should be received as early in the week as possible.



## TECHNICAL.

## LEGAL.



## PURCHASE.

## TOURING.

**RULES:**—Questions on technical matters, advice in selection of a new machine, etc., will be answered in the next issue after receipt of the inquiry so far as possible. Letters or postcards must be marked "I. and A." on the top left-hand corner. Questions must be numbered, and a copy kept for reference. Machines upon which an opinion is sought should be numbered. Replies can also be sent by post if a stamped addressed envelope for that purpose is enclosed. Routes and legal queries are answered only by post.

B.S. (Woking).—We regret that the issue you require is out of print. The cutting you enclosed has been sent us by several other readers.

F.M. (Bolton).—Providing you store your motorcycle away and partially dismantle it, there will be no need for you to take out a Revenue licence.

O.W. (Shortlands).—(1 and 2) We should advise you to write to Messrs. O. Binks, Ltd., Phoenix Works, Church Street, Eccles, Manchester. (3) About £5.

B.S. (Sale).—There are very many  $2\frac{1}{2}$  h.p. Douglases on the road with featherweight sidecars attached. The  $3\frac{1}{2}$  h.p. open-frame Brough is quite a reliable machine.

G.McK. (Carlisle).—(1) We think the first machine you mention would probably prove the best, although the second runs it very close. (2) Probably the second. (3) Belt.

E.R.C. (Brentwood).—It is highly doubtful if you can obtain a petrol licence. Application should be made to the Petrol Control Department, 19, Berkeley Street, London, W.

G.F.N. (Cirencester).—The trouble sounds to us as though it were caused by the timing gears, although possibly it may be due to a slightly slack little end. You should also check the adjustment of the valve tappets.

E.E.O. (Somerset).—We should advise you to purchase "Motor Cycling Manual." A very useful chart is provided at the end of the book which simplifies the tracing of trouble which may occur on the road or at any time.

**Converting to Coal-gas.**—A.S. (Sheffield).—We understand that the Service Co., of High Holborn, London, W.C., intend making a complete set of fittings for motorcycles in order to enable them to be run on coal-gas.

**Vaporizers.**—W.R.B. (Manchester).—(1) It would be advisable to fit a vaporizer. (2) The Grado vaporizer is very satisfactory. This is made by the Grado Manufacturing Co., Pershore Street, Birmingham.

**Machine for a Doctor.**—J.L.B. (Blaina).—The Douglas  $2\frac{1}{2}$  h.p. motorcycle is considered to be an excellent machine for a doctor, and we do not think you would be able to obtain a better mount for your work.

**Lighting Queries.**—G.A.S. (Rhondda Valley).—You can use two 4-volt lamps off an 8-volt accumulator by wiring these up in series, so that the current first passes through one lamp and then through the other before returning to the accumulator.

**Petrol Problems.**—R.S.C. (Twickenham).—We should advise you to write or, better, call on the Petrol Control Department, 19, Berkeley Street, London, W., and explain the situation to them. Although we hold out no hope of your being successful, it is your only chance.

**Gas Problems.**—S.P.T. (Earle Colne).—(1) The orifice into the carburettor for the gas should be, for your machine, a little under  $\frac{1}{4}$  in. (2) We have not found any necessity for gas to prevent a fireback. (3) A 26-in. by  $2\frac{1}{2}$ -in. inner tube on a spare wheel would not hold 3 cubic ft. of gas at 90 lb. pressure, so that this system of carrying the gas is not worth consideration. (4) Too much gas will certainly not damage the cylinder. (5) It is certainly advisable to fit a tap unless you wish to waste the gas.

H.J.W. (Goodmayes).—(1) The oil you are using is, we should imagine, correct. (2) See 1. (3) About every 7 miles. (4) About every 5.

G.C. (Wallenham).—We regret, we cannot let you have a sketch of the N.S.U. two-speed gear showing details which would enable you to make the spare parts necessary, and we should advise you to communicate with Messrs. Eagles and Co., Acton Hill Works, Acton, London, W. 3.

D.F.W. (Oxford).—(1) Several. (2) The bevel gear. (3) No. (4) 50 m.p.h. (5) 65 m.p.g. petrol; 200 m.p.g. oil. (6) It is a fact. (7) You should write to the Secretary, the War Office, Whitehall, London, who will give you all the information you require with regard to the R.F.C. cadets.

*WILL our readers reduce the needless trouble experienced in the working of this bureau by carefully obeying the rules, especially when a route query is made? "I. and A." "Route," or "Legal" should be distinctly marked on the left-hand corner of the envelope or postcard.*

G.H. (Sheffield).—With regard to your question as to how to descend a hill, we cannot quite understand what you require. The I.O.M. Rudgo would certainly take a light sidecar. Disc wheels do greatly affect the steering in windy weather.

J. McD. (Liverpool).—(1) We should advise you to state your exact requirements to Messrs. Godfrey's, Ltd., Great Portland Street, London, W. (2) We do not think you ought to purchase any machine lower than 4 h.p. (3) "Motor Cycling Manual."

S.L. (Paris).—(1) The machine you mention is a very good solo mount, and, properly tuned, is capable of over 70 m.p.h. (2) Yes. (3) A Euk easy starter is always useful. (4) You might fit a higher gear, but we do not think it would be exactly advisable.  $3\frac{1}{2}$  to 1 would certainly be too high.

S.W. (Cornwall).—(1) It is necessary to have a permit to use paraffin or any substitute. (2) You should either have the numbers transferred to your name at a cost of 1s. or take out new numbers at a cost of 5s. In the case of the old numbers, you should write to the clerk of the county council to which the numbers belong. (3) An Inland Revenue licence, £1, is obtainable from a post office.

**A Correspondence Course.**—S.M. (Rochester).—Your best plan will be to communicate with Mr. Hammond, of the International Correspondence Schools, International Buildings Kingsway, London, W.C. The I.C.S. have several courses which would probably prove of great help to you. It is, of course, of great assistance to have practical experience, but if you obtain a thorough grounding through the winter in the theory, there is no reason why the practice should not come fairly easily to you. You might be able to make some arrangement with one of the local garages for you to spend some time in there during any of the days you have free.

D.A.N. (Reigate).—The fitting of a long pipe to the air inlet of the carburettor would assist matters.

A.E.M. (Retford).—We think you will be quite safe in carrying out the method you suggest of cleaning the oil from your engine.

F.O.G. (Kidderminster).—In all probability your trouble is caused by the petrol level in the carburettor being too low. You should raise this. We do not think that it is magneto trouble.

V.K. (Bombay).—(1) Not unless you have a special permit. (2) You are using too large a jet. We should advise a 25 or 24. (3) Autoped. are not in common use in England. They are made by a firm in America. We have had no experience of them.

A.A.F. (Monmouth).—There is no reason why you should not have the pulley flanges trued up in a lathe. As you are fitting the sidecar, we should certainly advise you to keep the two-speed gear. You will require to dismantle the gear to remove the pulley.

**Saxon Forks.**—H.M. (Grimsby).—The address you require is Messrs. S. S. Ridgway and Co., Coventry Road, Birmingham.

**Dixie Magneto.**—P.C. (Ilkeston).—The English agents for the Dixie magneto are the American Supplies Co., Ltd., 162, Great Portland Street, London, W.

**Hub Gears.**—C.B. (Brixton).—Hub gears can be repaired by the County Cycle and Engineering Co., 61, Staines Road, Hounslow, and the Cromwell Engineering Co., Putney Bridge Road, London, S.W.

**Running on Paraffin.**—H.N. (London, N.).—(1) Good results are obtained on the machine you mention with paraffin. (2) A vaporizer should be fitted. Try an Attwoods. (3) It is possible to fit a light sidecar to this machine. (4) This is highly improbable.

**Gas Problems.**—A.M.H. (Cork).—(1) The idea which you saw for storing coal-gas under pressure in cylinders under the sidecar was merely a suggestion by a man who was carrying coal-gas under compression in three small cylindrical tanks on his  $2\frac{1}{2}$  h.p. Motosacoche. Whether it would be possible or not to run over 100 miles on gas compressed in this manner would naturally depend on the number of cubic feet of gas stored, as well as the consumption of gas by the engine, and the pressure to which the gas was compressed. (2) The gas would be compressed with either compressing machinery or by means similar to that carried out by our contributor who suggested this system. (3) The alterations at present made to the carburettor would need to be no more than those which were made to our 8 h.p. Zenith, a sketch of which was given in our issue of the 18th September. The size of the orifice through which the gas would be allowed to escape depends on the size of the engine. As yours is a 4 h.p. single-cylinder machine, we should think 9-32nds would be the correct size. (4) If the gas gave out on a long journey and there were no charging stations near, there is no reason why the machine should not be run home on petrol, providing, of course, you were able to obtain it.

**Route Replies.**—H.A.L. (Radlett).—We should advise you going via Watford, Thing, Aylesbury, Bicester, Banbury, Stratford, Leicester, Bromsgrove, Kidderminster, Bridgnorth, Wenlock, Shrewsbury and Middleton.

L.H. (London, S.E.).—The Bath Road route probably offers the best prospects for a clear, quick run, i.e., via Hounslow, Slough, Maidenhead, Reading, Newbury, Hungerford, Marlborough, Beckhampston, Devizes, Trowbridge, Frome, Shepton, Glastonbury, Taunton, Wellington, Callington, Exeter, Alphington, and Newton Abbot.

J.W.H. (West Bromwich).—Your best plan would be to make direct for Cardiff via Bromsgrove, Worcester, Malvern, Ledbury, Ross, Monmouth, Usk and Newport. You could then run up via Newport and Pontypool to Blaenafon, continue via Brynmawr to Tredegar, and return to Cardiff through Hollybush, Maes-y-cwmmer, Caerphilly and Nant-garw. From Cardiff it is a good main-road run through Cowbridge, Bridgend and Aberavon to Briton Ferry, and thence on via Neath, Swansea and Loughor to Llanelli. If convenient, however, there would be a big saving by going on direct from Tredegar via Merthyr and Hirwain to Neath, which is close to Briton Ferry. There is a good direct route back from Neath, viz., via Hirwain, Brecon, Hay, Leominster, Tenbury, Bewdley and Kidderminster: this would save a lot of time if there were no need to go back to Cardiff.

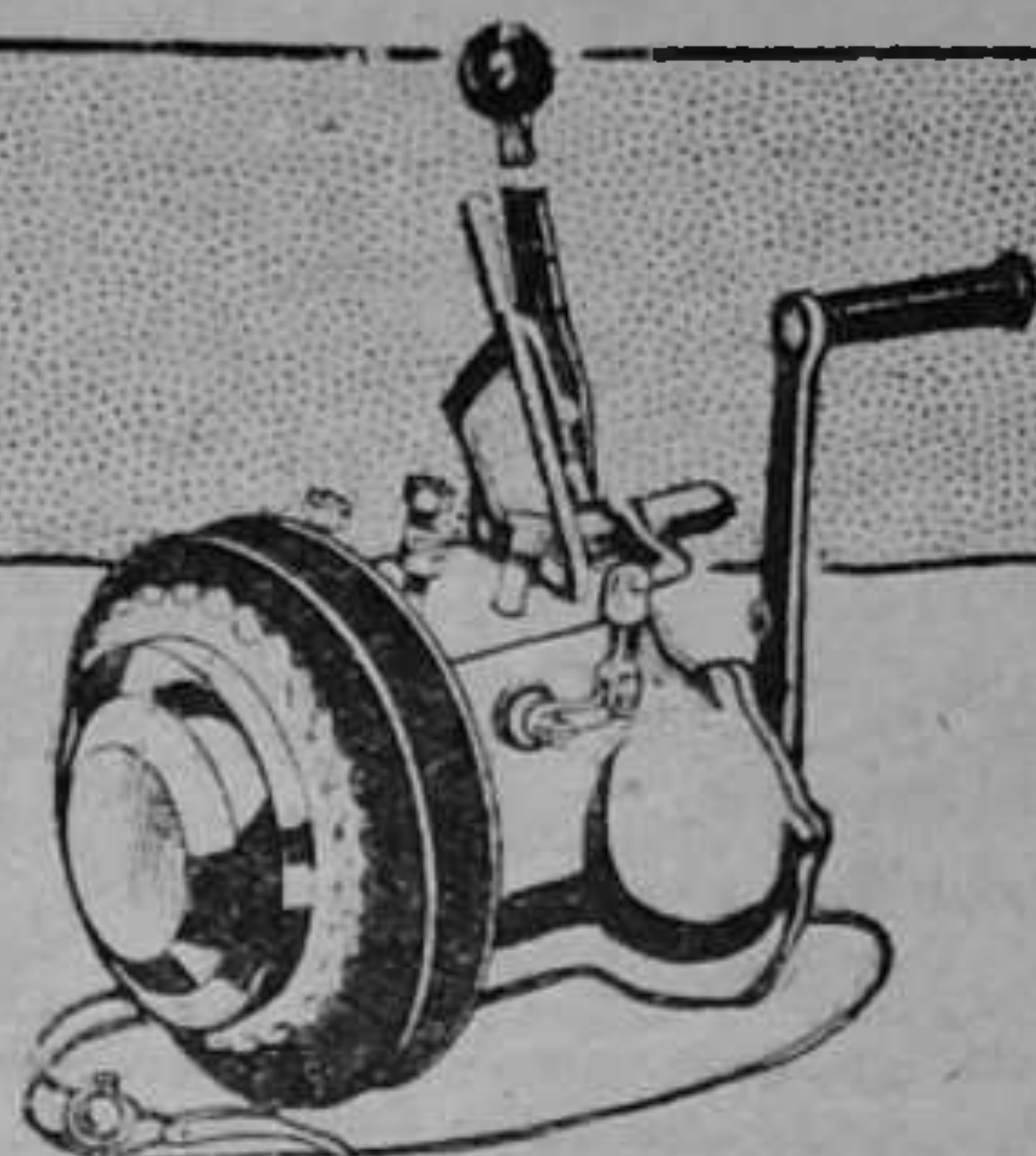


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in

## Motor Cycling

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"Somewhere in France."

When you're feeling tired and lonesome  
And you're full of mud and wet,  
And the shells are crooning moansome  
And the German sights are set.  
When you've got to take a message  
Through a land of shot and shell,  
And you don't know how you'll get there,  
Past that crashing mouth of hell.  
Then you tighten up your belt, lad,  
Think of home and mother dear,  
Shove the message in your pouch, and  
Trust to luck and to your gear.  
For you've got to suit your pace, then,  
To the dropping of the shells.  
It's the sprint, and then the halt, and  
Then a hurried rush that tells.  
Your life is on your gear then,  
And you bet that all of us  
Who have got the job out here are  
Mighty careful of our "bus."  
That's why every Army rider  
Who's been half-a-week at war,  
Swears by the Sturmey-Archer,  
For we know then where we are.  
It's a gear that's tried and trusted,  
That's standing day by day,  
To help us on our long, long road,  
Our hard, victorious way.  
And when the war is over,  
And we're back again with you,  
We'll shout for Sturmey-Archer,  
The gear that saw us through!

The above impromptu from a despatch rider who has "done his bit" is but one of thousands of testimonies to the efficiency and service of the

**STURMEY ARCHER**  
COUNTERSHAFT GEAR

Sturmey-Archer Gears, Ltd., Nottingham.





# MotorCyclingMart

## NOTICES.

"MOTOR CYCLING" is published in London every Tuesday morning.

HEAD OFFICES—7-15, ROSEBERY AVENUE, LONDON, E.C. 1. Telephone—Holborn 5292 (four lines). Telegrams—"Motor Cycling, Phone, London."

MIDLAND OFFICES—9 & 10, Burlington Chambers, New St., BIRMINGHAM. Telephone No. 2498 Midland. Telegrams—"Presswork, Birmingham." 6, Warwick Row, COVENTRY. Telephone No. 983 Coventry. Telegrams—"Presswork, Coventry."

NORTHERN OFFICES—196, Deansgate, MANCHESTER. Telephone No. 2467 Central. Telegrams—"Presswork, Manchester."

### ADVERTISEMENTS.

Advertisements of Motorcycles, Accessories, Sundries, close for press 10 a.m. WEDNESDAYS, and are inserted in this section at the rate of

**Twelve Words for 1/- (Minimum)**

and One Penny for each additional word.

All words in name and address are charged for.

Five per cent. discount is allowed for series of 13, 10 per cent. for series of 26, and 15 per cent. for series of 52 consecutive insertions. Terms—cash with order.

### Displayed Advertisements

of all kinds are inserted in this Section at 13s. 6d. per inch, single column. Terms for a series or for larger spaces on application.

All Advt. orders are subject to confirmation in writing from the Head Offices.

All Advertisements and Contracts are accepted and made upon the express condition that the Publishers have the absolute right to refuse to insert copy to which they may object for legal, public or trade reasons, and such refusal of copy shall not be a good ground for advertisers to stop a current contract or to refuse to pay for the same or for taking action for breach of contract. Whilst every precaution is taken to ensure accurate printing, the Publishers will not be responsible for printers' errors, nor will they be responsible for advt. blocks that are left in their possession for more than one year.

All Communications respecting "Advertisements" must be addressed to "The Manager," "MOTOR CYCLING," 7-15, Rosebery Avenue, London, E.C. 1.

Advertisers desiring to have replies sent care of "MOTOR CYCLING" may do so on payment of a nominal fee of 6d.

**DEPOSIT SYSTEM.**—The intending buyer forwards to our office the amount of the purchase money, which will be acknowledged to both parties. Notes or Money Order save time. Money Orders should be made payable at the Money Order office, at 114, Farringdon Road, E.C., and drawn in favour of Temple Press Ltd. Cheques must be made payable to Temple Press Ltd., and are acknowledged to seller when "cleared." If a sale is concluded, we forward to the seller the amount agreed upon. If no sale is made, we return the amount deposited. In either case we deduct a commission of 1½% (3d. in the £, minimum 1/-) on the amount deposited, to cover our expenses of booking, postage, etc. Carriage is to be paid by the buyer. If the article is returned, each party pays one way. The risk of damage in transit is the seller's. Articles on approval are not to be retained more than three days, unless by arrangement between the parties. All disputes to be settled by the arbitration of the Editor of "MOTOR CYCLING."

### MOTOR-BICYCLES.

—**ABINGDON**, 1916, 3½hp, T.T. model, front and rear lamps, absolutely as new, £36, E.P. or exchange. Service Co., 292 High Holborn, London. 413-503

—**A.J.S.**, 2½hp, 1915, with 3-speed countershaft gear, clutch and kick starter, engine recently overhauled, tyres in good condition, £47 10s. Extended payments arranged. Harrods Motor Showrooms, 118 Brompton Rd., London, S.W. 1. 413-451

—**A.J.S.**, 2½hp, 1913-14, 2-speed clutch and kick-starter, enclosed chain, £38, E.P. or exchange. Service Co., 292 High Holborn, London. 413-504

—**ALLDAYS** Allen, 1917, 2-speed, i.e., only done 800 miles, will sacrifice £28 10s., or exchange. 53 Swaffield Rd., Wandsworth. 413-d736

—**ALLONS**, 1917 models, early delivery. W. P. Edwards, Taunton. zzz-361

—**ALLON**, new, 2½hp, 2-stroke, all models in stock for immediate delivery, the stout-hearted lightweight. Extended payments arranged. Harrods Motor Showrooms, 118 Brompton Rd., London, S.W. 1. 413-448

—**ALLON**. Colmore Depot, Birmingham and Manchester, for immediate delivery of Allon 2-strokes. zzz-520

—**ARIEL**, 1912, 3½hp, Bosch, E.B., hand-controlled clutch, red finish, climb anything, £16 10s. Ross, 110 West Bromwich Rd., Walsall. 413-d734

—**ARIEL**, new, 3½hp, 3-speed countershaft gear, clutch and kick starter, decompressor, patent spring seat pillar, £72. Extended payments arranged. Harrods Motor Showrooms, 118 Brompton Rd., London, S.W. 1. 413-449

—**ARIELS**. Colmore Depot, Birmingham, Manchester, Liverpool, and Leicester for Ariel motorcycles. zzz-521

—**ARNO**, 3½hp, 3-speed Armstrong hub gear, good order, £20. Jones's Garage, Broadway, Muswell Hill, N. 10. 413-535

—**AUTO-WHEEL**, excellent order, single-lever control, £6. Parkes, 11 Clanricarde Gdns., London, W. 2. 413-d769

—**BAT-J.A.P.**, 1915 5-6 combination, 3-speed, clutch, kick, accessories, good condition, trial, 70 gallons, 48 guineas, or lightweight part. 186 Sydenham Rd., Sydenham, S.E. 413-d751

—**BAT-J.A.P.**, 1915, 5-6hp, chain drive, countershaft gear, T.T. bars, and sporting sidecar, very smart lot, £54 10s. Collier's, Deal St., Halifax. 413-480

—**BLUMFIELD**, late model, 5-6, twin, magneto, new heavy Dunlop tyres, overhauled, re-enameled red, runs well, only £23 10s. cash; easy terms, quarter down, 12 monthly payments. Wandsworth Motor Exchange, Ebner St., Wandsworth (Town Station). Phone, Battersea 327. 413-g315

—**BRADBURY**, 3½, T.T., 2-speed gear, extra fast one, splendid condition, complete with Millford sidecar, lamps, tools, etc., £32, absolute gift. Else. Dimple, Matlock. 413-d739

—**BRADBURY**, 1914, 3-speed countershaft gear, coach sidecar, 36 guineas, deposit. Rider Troward and Co., 31 and 78 High St., Hampstead. 413-541

—**BROUGH**, 1916, flat twin, Sturmey 3-speed countershaft, fine order, 57 guineas, deposit. Rider Troward and Co., 31 and 78 High St., Hampstead. 413-543

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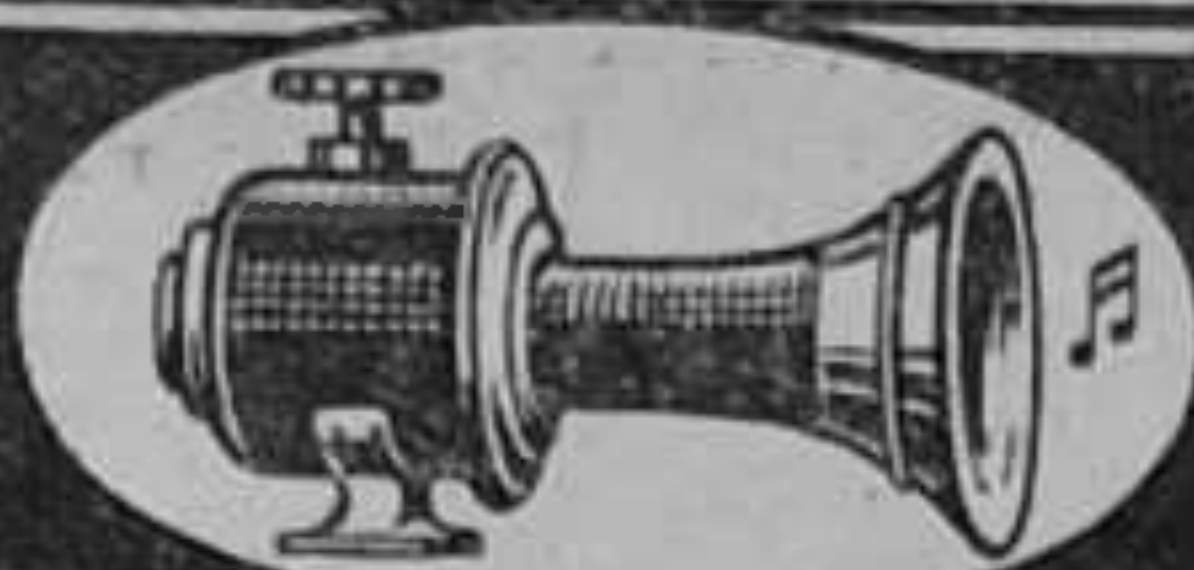
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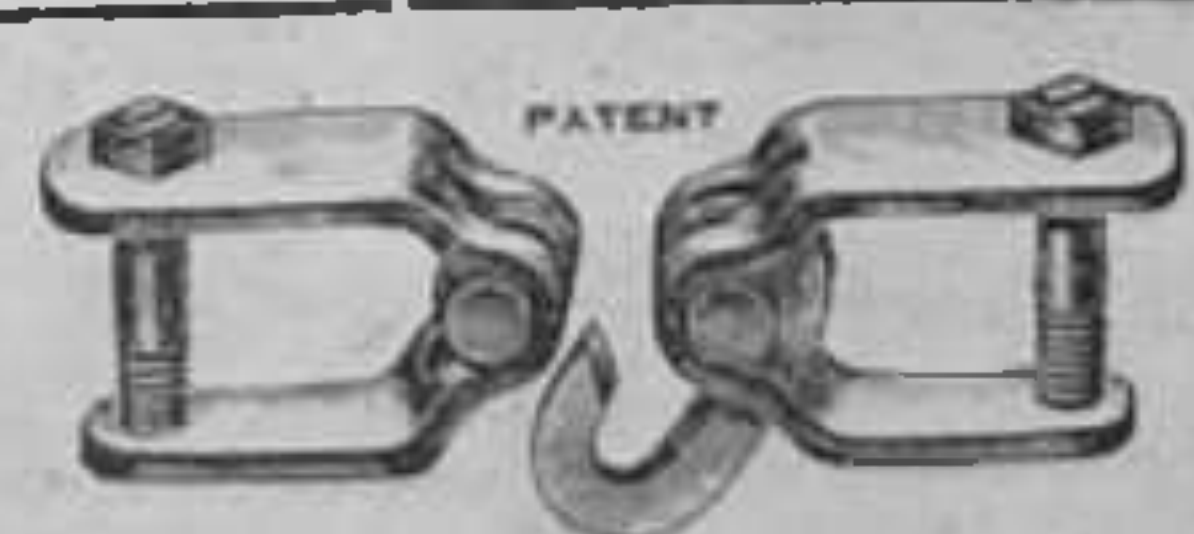
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—**ROVER** latest 1917 combination de luxe, cost over £98, mileage 4000, 69 guineas, deposit. Rider Troward and Co., 31 and 78 High St., Hampstead. 413-563

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—**ROVER**, 3½hp, late 1916, 3-speed countershaft, kick starter, headlamp, generator, rear lamp, very nice mount, perfect throughout, £55. Mobes and Mobes, 156 Gt. Portland St., W. 1. Tel., 3426 Mayfair. 413-471

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—**MAGNETO** repairs by manufacturers. We regret owing to extreme pressure of business we are unable to undertake any private repairs until further notice. Kenyon and Torrance, Manchester 414-102

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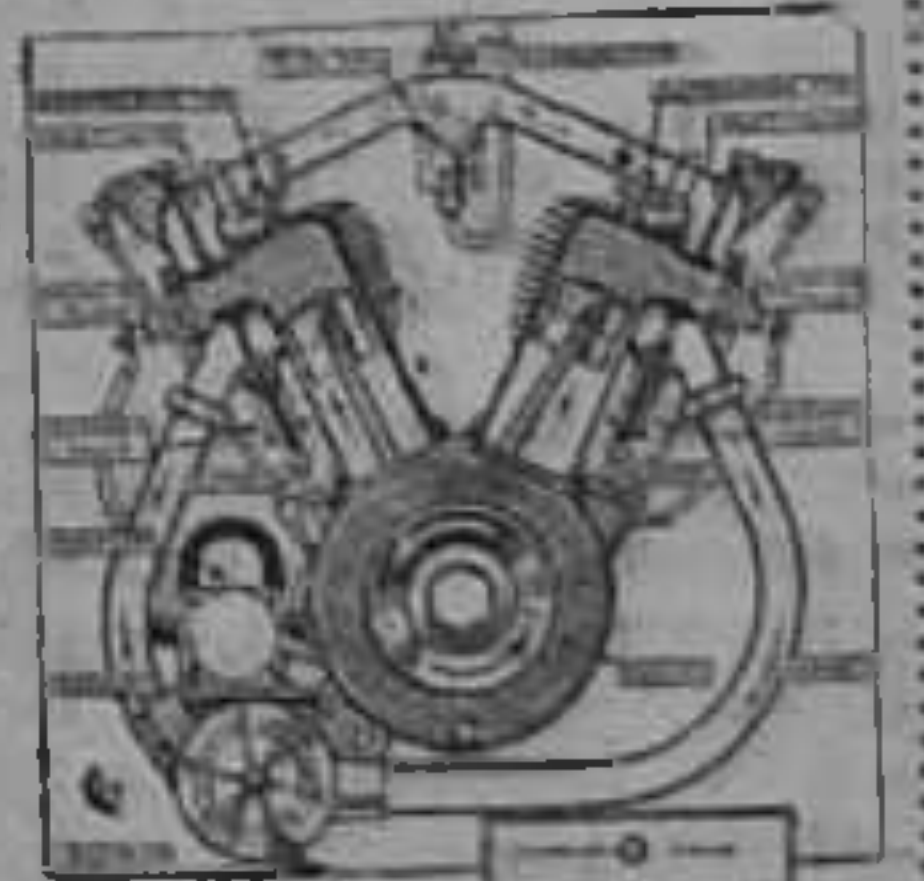
"Secrets of Tune" is the work of many hands—33 writers having contributed to the book. Every one of these contributors is a prominent performer, either on the track or on the road. "Secrets of Tune" represents the results of their tested experience. Even those motor-cyclists who do not aspire to speed work will find the contents of this book of the greatest interest, as giving an insight into the methods of performers in trials and at Brooklands.



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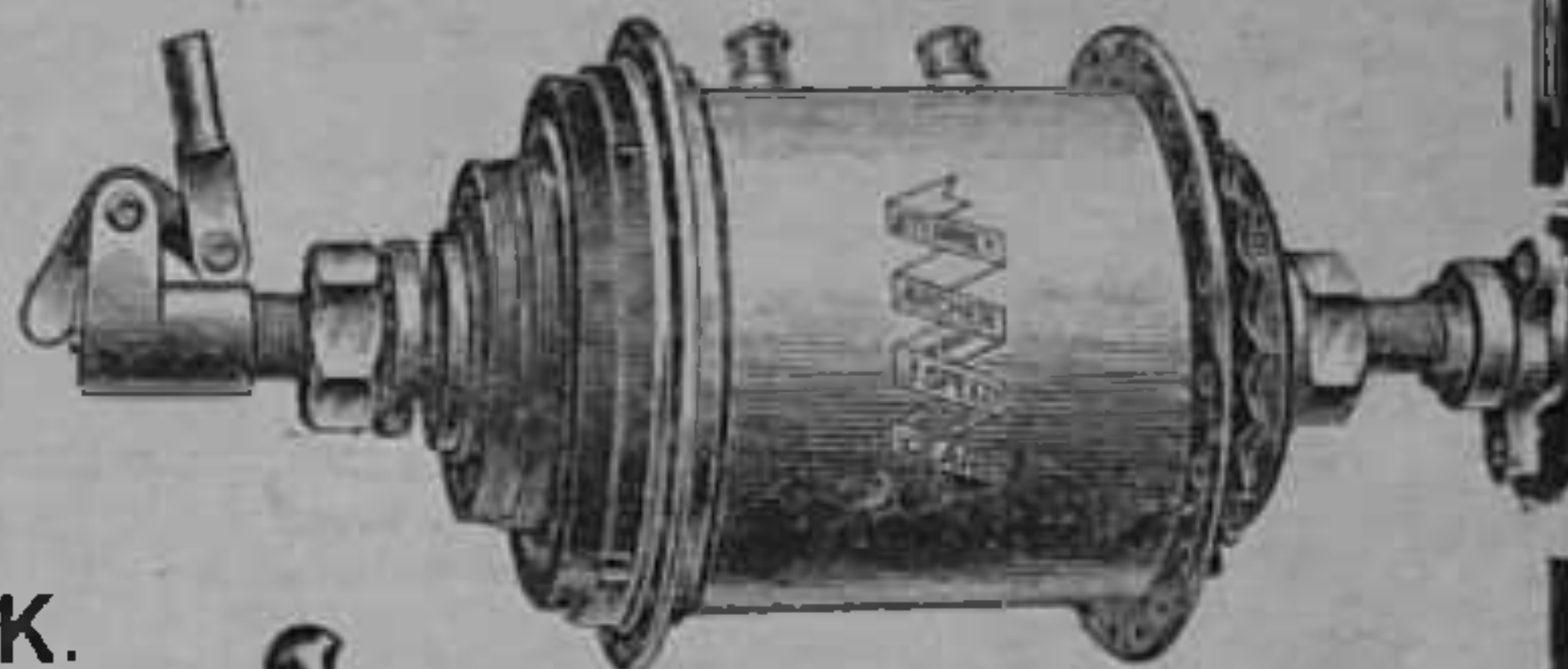
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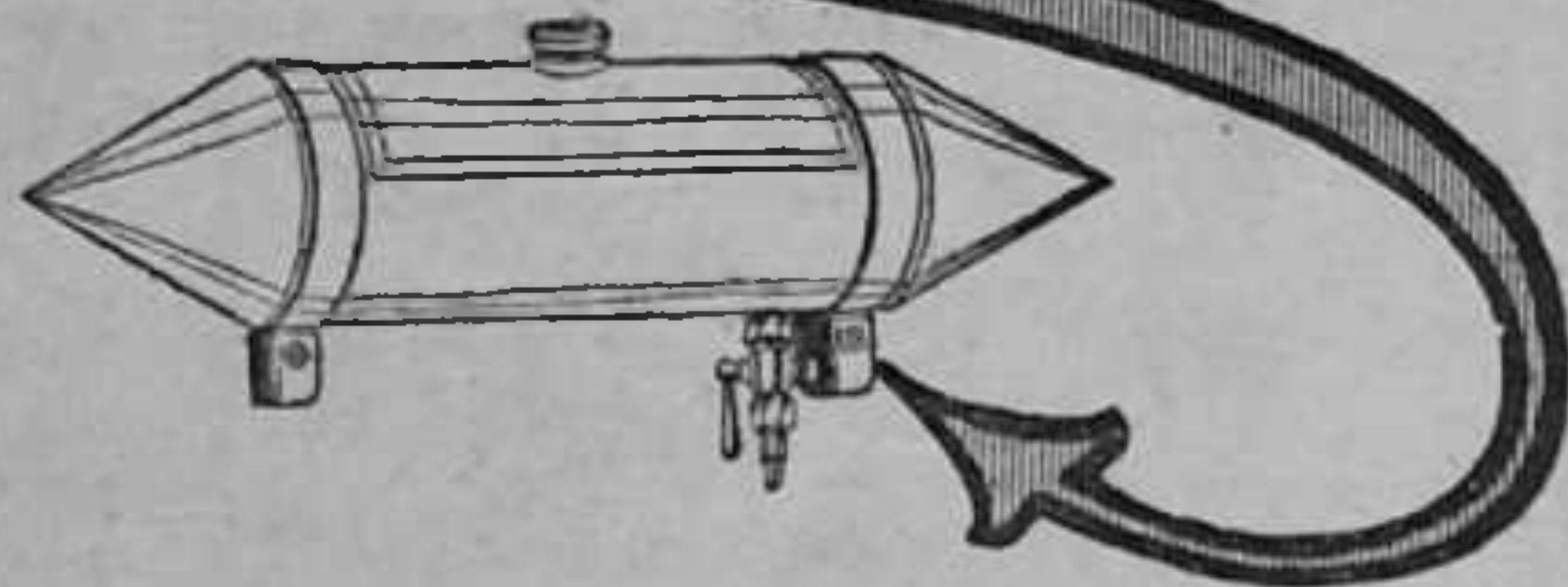
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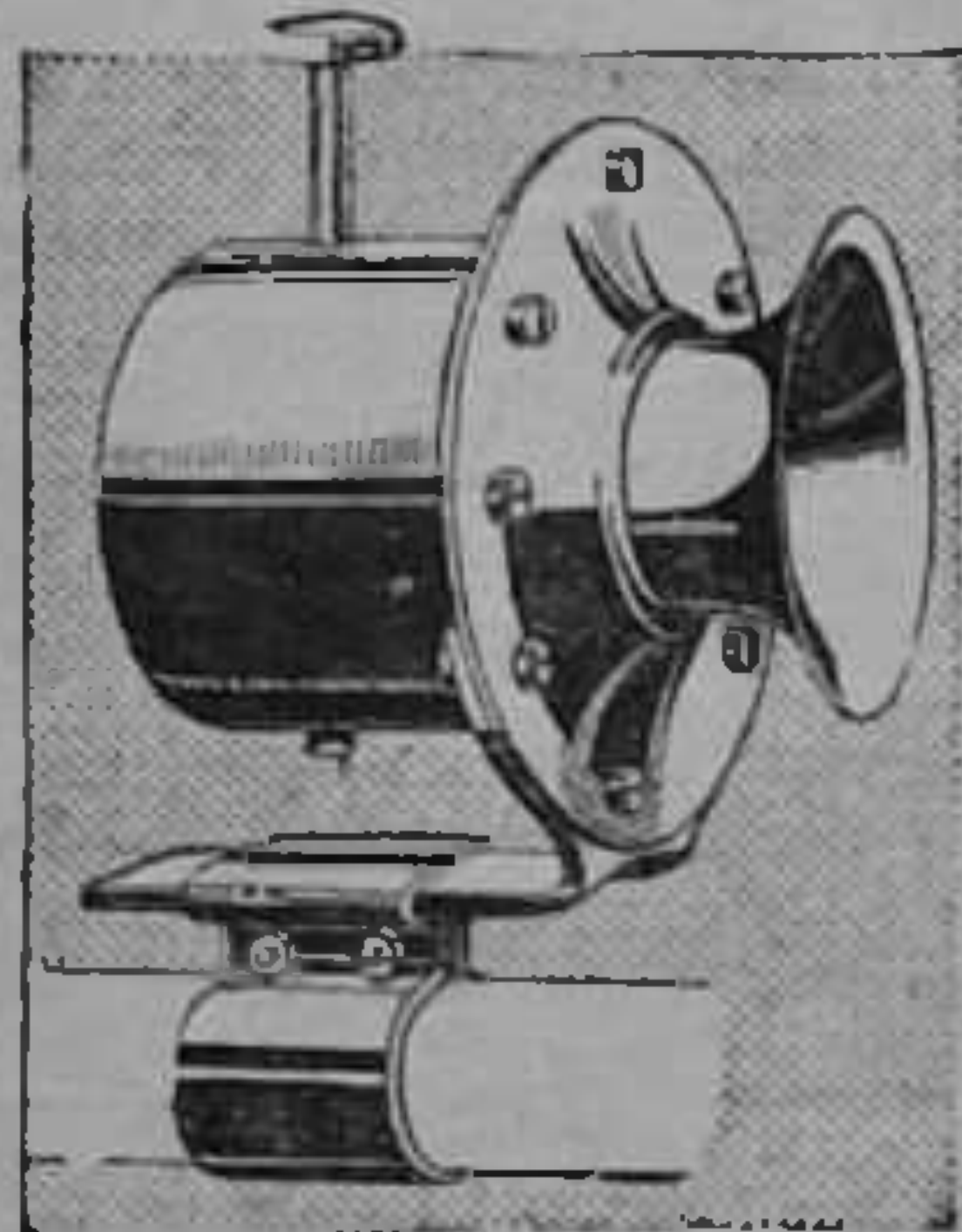
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Complete Set 78/-

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A new method of obtaining light, sufficient for two lamps, from the extra current produced by magneto, which has been wasted so far. As soon as engine starts, the lamps light. Perfectly simple and foolproof. No trouble in future to get your lamps lit. An accumulator is fitted into box for use when machine is at a standstill.

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Under the above regulation, advertisements offering situations with firms whose works are situated within 30 miles of London and whose business consists wholly or mainly in engineering, shipbuilding, or the production of munitions of war, or of substances required for the production thereof, must contain the words — "NO PERSON ENGAGED ON GOVERNMENT WORK OR RESIDENT MORE THAN 10 MILES DISTANT NEED APPLY."

When the advertiser's works are situated more than 30 miles from London all applications must be made through a Labour Exchange, by means of a box number allocated by the Board of Trade. Forms of application may be obtained from any Labour Exchange, or from the offices of this paper. Each advertisement must clearly state that no person already engaged on Government work need apply.

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—J.A.P. spare parts in stock, valves, pistons, rings, 4hp and 8hp pistons, bushes, valve guides, exhaust and inlet, union nuts, etc.; Douglas spares, a large variety, chiefly 1910, 1911 and 1912; B.S.A. spares, a few parts left; Triumph spares, a large variety; Sturmev-Archer 3-speed gearbox parts in stock; Rover, Singer and Premier spares, a few in stock. Jones's Garage, Broadway, Muswell Hill, N. 10. The straight and square firm. 413-536

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—THE Editor of "The Commercial Motor" will be pleased to be advised of any stocks of old type or obsolete commercial-vehicle spare parts, as well as of spares for those touring-car models which are commonly used for conversion to delivery vans, etc. Particulars should state types and principal parts available, and these will be included in the Spare Parts Bureau list published regularly in the editorial columns of "The Commercial Motor." Letters should be marked "Spare Parts," and addressed to The Editor, "Commercial Motor," 7 Rosebery Ave., E.C. zzz-75

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—TANKS made of every description, repairs, re-enamelling. Write for booklet, Green, Water St., Blackfriars, Manchester. 419-680

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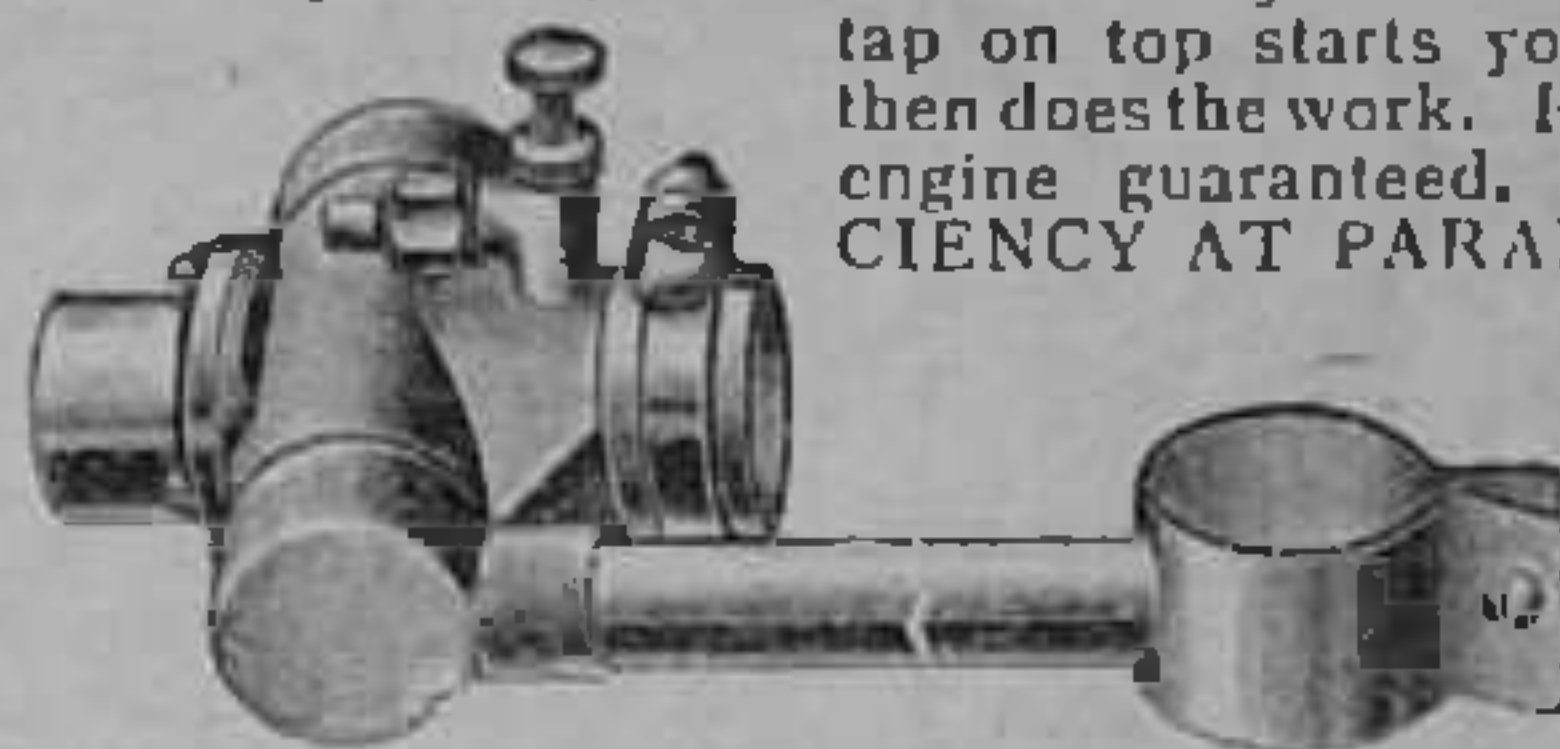
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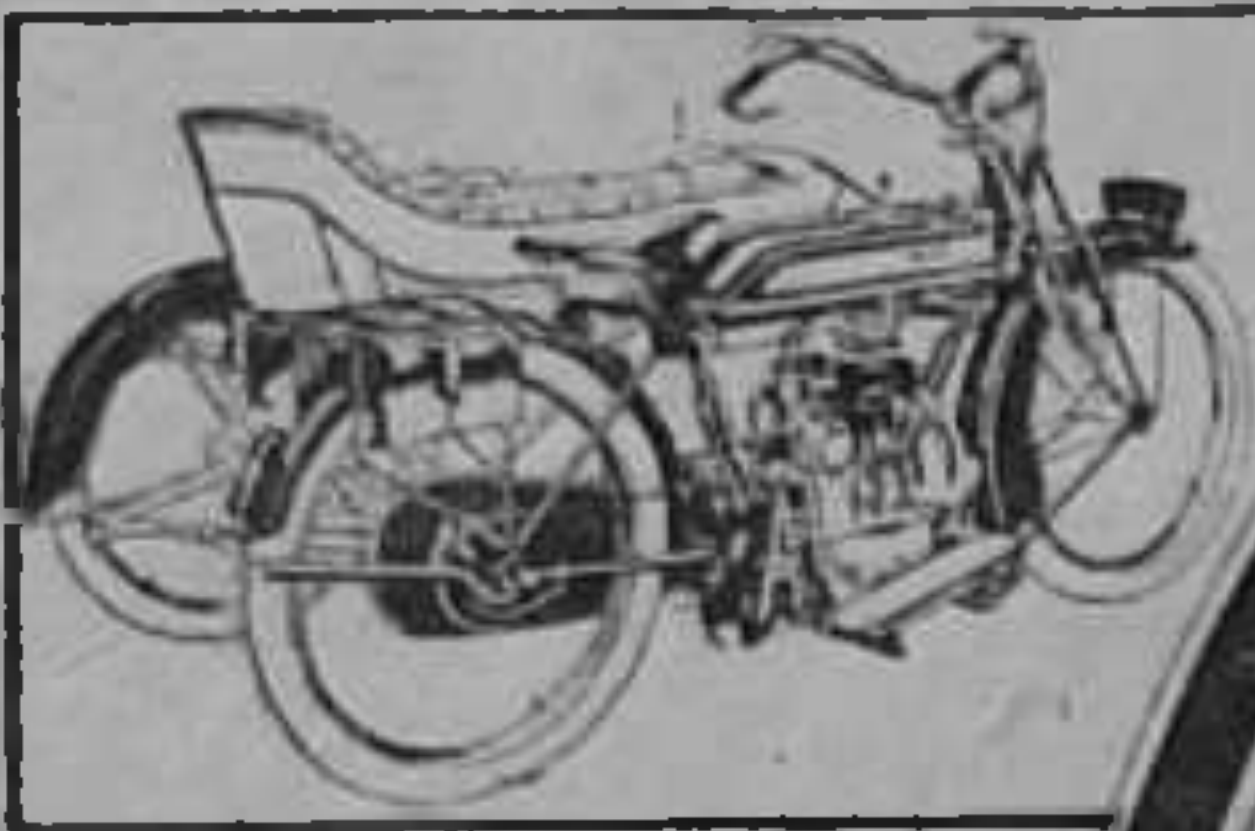
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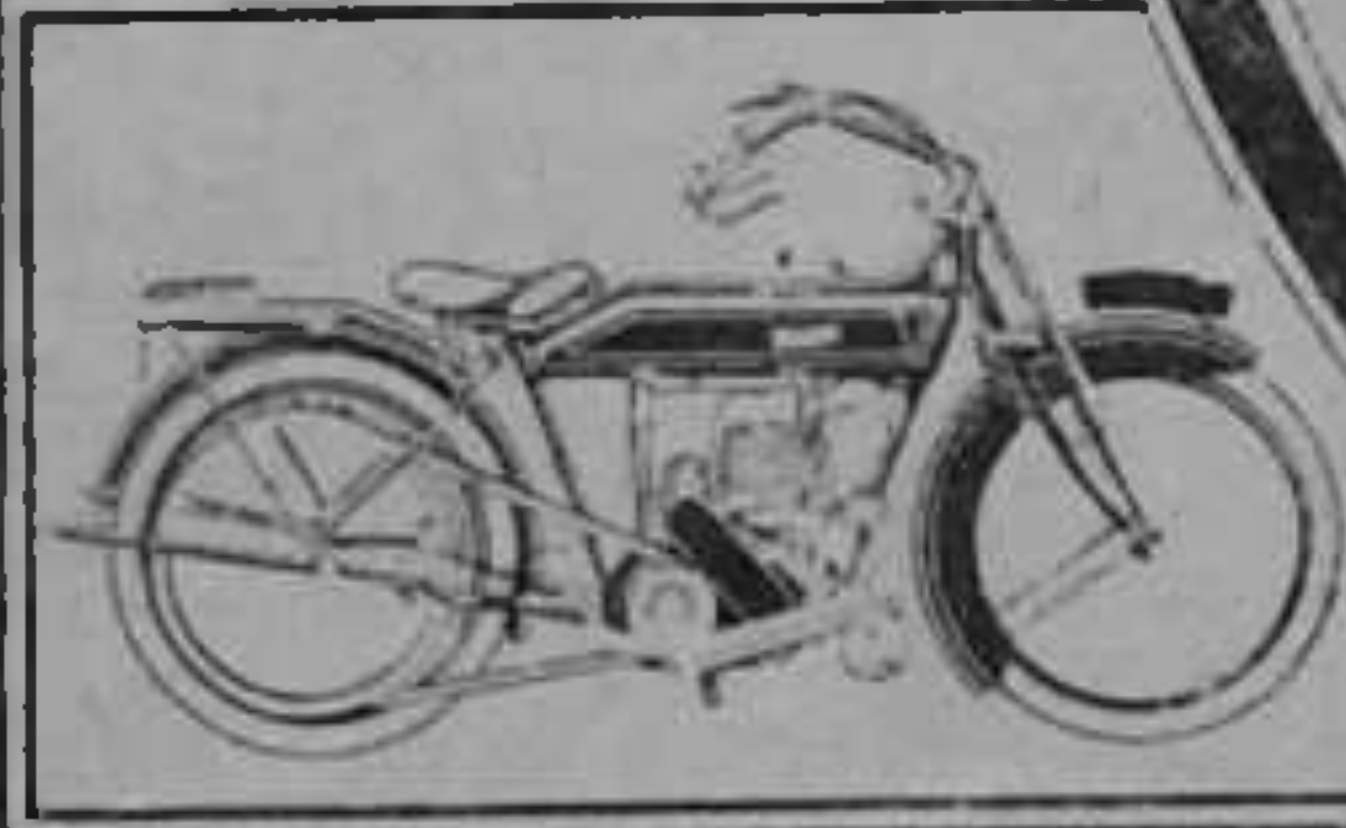
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